

Buddha's Brain: The Science and Attention of Mind Training

A dialogue with Dr. Rick Hanson and Acharya Fleet Maull

[0:00:00.0] Fleet: Hi, welcome to the Shambhala Mountain Center Science of Meditation online conference. And here we are on day one with our very first presentation with Doctor Rick Hanson. Hey Rick, good to see you.

[0:00:12.9] Rick: Great to be here, truly great.

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[0:01:59.2] Fleet: So I think we're going to kick it off, this first day of the Science of Meditation conference is focused on attention and relaxation. So why is attention important, even just in terms of our day to day lives, what's the big deal about attention?

[0:02:19.5] Rick: Right, it's a great opening question and I go back to the title of the conference itself, the science of meditation. And the root of the word of science is knowing, knowing what is true, seeing clearly. And it's interesting that as you know, the root of the word for Buddha, is to know, to see what's true and to penetrate through ignorance, delusion and confusion which creates so much suffering and harm for ourselves and for other people. So it is very interesting to think of the common roots of the, if you will, the western tradition of science which is now of course global and the more eastern traditions of contemplative practice including and exemplified by Buddhism that are both grounded, fundamentally in the same trunk of the tree of knowing. So how do we know? Well, we know fundamentally by placing our attention on something. You know, there's the old line "You are what you eat", actually the modern update based on what's called experience dependent neuroplasticity is that you are what you pay attention to and more exactly, what you do with what you pay attention to, because attention in terms of its functions for us as biological embodied creatures, living animals. Attention function says, like a vacuum cleaner with a spotlight on it, it illuminates what it rests upon and then sucks it into our brain because in the traditional saying the mind takes its shape from what it repeatedly rests upon. The modern update would be your brain and therefore much if not all of you, fundamentally, your experience of living takes its shape from what your mind rests upon. So getting regulation over and real-time mindfulness stuff, where your attention is being placed is incredibly useful. There's kind of a famous saying in neuroscience; neurons that fire together, wire together. And that process of structure building and lasting change where we hardwire into ourselves, what we are paying attention to is really turbocharge for what's in the field of consciousness. So I think that's why, just to finish here, it's so important to be able to get some kind of awareness of where your attention goes, especially in the world that we live in, which is grabbing attention and pulling it into all kinds of different directions, and then based on what your attention rests upon, practicing skilful with what's there so that over time, bit by bit by bit, as the Buddha guide says and there's all kinds of other great teachers and modern scientists and psychologists today guide us, you can gradually nudge yourself over time, bit by bit in a better and better direction for your own sake and for the sake of other people's.

[0:05:20.2] Fleet: So our brain is in essence really a self-organising and self-correcting learning machine of sorts, and really what it learns depends on what we feed it, what we expose it to?

[0:05:30.8] Rick: Yeah, that's a really good way to put it. You know, William James, kind of the godfather of psychology in America said or wrote rather over a century ago on the education of attention, would be the education par excellence. And to be clear here, if you just kind of make a common <inaudible 0:05:52.3>, right now people listening are having experiences, right, and sensations in the body, thoughts, feelings, hopes, dreams, suffering and happiness, we're having

experiences. What are the causes of those experiences? Well, locally those causes are being continually constructed by, constrained by and conditioned by the nervous system, headquartered in the brain. Now those processes are embedded in a larger network of causes, which is embedded in an even vaster network of causes including nature and human culture and all the rest of them, but it's really possible that among those causes are transcendental or supernatural influences, outside of the natural frame. I'll try to stay mainly inside if not entirely inside the natural frame as we're talking here. It's said that even though we're part of this vast web or network of causes, locally the final common pathway of most, if not all of those causes runs right between your ears and scientists are getting clearer and clearer and clearer about the underlying neural functions and structures that are the basis for our most intimate experiences of being alive. So as we'll get into it, I'm sure, a little further, by knowing a little bit more about what's going on under the hood, as it were, in very practical ways you can reach down inside those structures and functions and through mental activity alone, not drugs, not surgery, no electrodes are involved in this experiment, you can actually gradually stimulate and therefore strengthen, since neurons that fire together wire together, those characteristics in yourself that you want to encourage, including the fundamental superpower of mindfulness and attention and stuff. That's really really helpful for me and very very optimistic.

[0:07:54.5] Fleet: Absolutely, so for example our audience right now and even you and I, we're involved in this discussion, our audience is witnessing and listening to this discussion, so we're very <inaudible 0:08:04.2> and auditorially oriented at the moment, very cognitively oriented, which places the area of our brain activity kind of along the midline, right, this is the question, but if we all make an effort and I think I want to invite our audience to do so as we're listening, to be aware of our body, to feel the contact between our body and the chair, to feel our feet on the ground, to have more embodied opposed to sitting here engaging, more listening to this dialogue, that would shift something. In other words by expanding our attention that would shift something towards what's going on with our brain, is that correct?

[0:08:37.1] Rick: Yeah, I think back to in a sense what we're resting attention on is our most fundamental property in a sense, I mean we can have an intimacy with our own experience here, particularly in the larger context for lots of reasons, others, corporations, political forces, media, all the rest of that, workplace demands are continually trying to take that property in other words where we put our attention, which is yes it's really of autonomy and self-alliance so if we're going to be in some old fashioned kind of way, you know self-reliance, rugged, resilient and able to do things for ourselves as well as for the greater good of the world at large, we need to have some kind of internal autonomy in terms of where we put attention and how we relate to what we put attention on. So if, as you say, we you know help attention open and widen to include the whole of the body literally your right, activity starts to shift from midline processes in the cortex that are typically involved with focused attention or being lost in kind of thought and day dreaming and instead if we open into the body as a whole, if we kind of widen the spotlight of attention if you will, we start engaging networks on the sides of the cortex, on the sides of the brain, especially the right side for right handed people and the left half for left handed people, because the right side of the brain is specialised for gestalt or holistic processing. So if you go more into open awareness, of the whole, the whole gestalt let's say if your body and then even broader the whole of experience altogether, you can actually start engaging all of those lateral networks which are very involved in present moment mindful awareness, little sense of the future and the past, less sense of self, by the way, it's a live ego, so me, myself and I, supported by those midline activities and as you move more into that lateral mode you calm done this midline activity which does tend to spend a lot of time worrying about the future and resenting or self-criticising about the past. And that's really tracked in real time by modern studies and with repetition, since neurons that fire together wire together, as you

repeatedly go into that lateral mode of open presence grounded in the body, really being here right now, the leading edge of now, fine edge of now, just here receiving the next moment with an intimacy, with your own experience. As you do that you strengthen those circuits so you become more able to move back and forth at will. There's a place for midline activity directed more in the front, just kind of you know day dreaming or casually thinking about stuff in the back, but on the other hand <inaudible 0:11:39.3> are a place for being able to do what those lateral networks enable us to do which is quality of real grounded presence and really being here as the whole of ourselves, receiving the next moment.

[0:11:53.1] Fleet: Well that's I think pretty clear that marketers, media advertisers, cell phone media developers and so forth have learned how to train our attention. How about ourselves, can we learn to train our own attention?

[0:12:08.5] Rick: Yeah, there's much research about meditation in particular and mindfulness in general, as a way to train attention, and we become more able, many many studies show, to place our attention on what we care about. Pull our attention away from things that we don't care about so much and become less driven by stimulation hunger, you know this need for the next thing, right, and to help ourselves feel filled up. And in the process of that kind of attention training, there's some measurable changes in neuro-structural function that are very interesting, I'll go through some of them kind of quickly here, they're both really cool and they illustrate the <inaudible 0:12:53.7> of practice, which is good for many reasons, including helping to motivate ourselves to keep going, keep doing. And by the way, you don't have to be a perfect meditator, you don't have to go and be on retreat on the time, a lot of little things that are over time, but there's a technical term in neuropsychology, mobeta, more better, in other words more episodes of practice and more depth of engagements in your episodes of practice, which will go especially the latter one in which I have a particular interest in, helping yourself turbo charge your curve. In other words helping yourself when you are in practice to really receive the fruits into yourself in a lasting way. They ultimately get hardwired into your own body, rather than getting some kind of beneficial experience that doesn't make any lasting difference. I'm sure we'll get more to that later. Meanwhile, how does meditation practice or mindfulness practice more generally change the brain? One, it tends to increase activation of the left prefrontal regions relative to right prefrontal regions this is switched for roughly half of all left-handed people but I'll just speak of the majority of people here, and that's good, because your left prefrontal cortex is involved in approaching the good rather than avoiding the bad, which is more the prominence of the right hemisphere of the brain and the left hemisphere in the brain, particularly the left frontal is more involved in the regulation of negative emotion, putting the brakes on fear or anger or feeling hurt or ashamed. So you get more positive experiences, more wellbeing when you increase the strength of your breaks. And that's one of the reliable results of even something like just an 8-week course or even some shorter programs. Another benefit is that if you repeatedly meditate you tend to build a cortex, layers of tissue you're thinking in, building up more synaptic connections and bringing more blood flow to parts of the brain in the frontal regions that help regulate attention and emotion and action kind of top down, and also you build a cortex in a part of the brain, I'm pointing to my temporal lobes here, on the inside of the temporal lobes called the insula, which is important because it helps us tune into ourselves, and that's what you're doing when you're meditating right? You're regulating attention, you're building up that muscle right behind your forehead and you're also tuning into yourself, you're building that muscle too, that's the insula and you become more self-aware and you get a bonus benefit, because the insula is very involved in the empathy for the feelings of others and that's very good, right, so that's a very reliable result. Another major result is that you build up more tissue in a part of the brain called the hippocampus, which is good because it puts things in context and calms down the alarm bell of the brain the meatal,

that's another really nice, reliable benefit. Also people with long term practice tend to increase activation of what are called gamma wave brainwaves. Gamma range brainwaves. That's important because gamma is fast, roughly thirty to eighty beats per second that means you're synchronising millions, potentially billions literally of synapses so they're all firing synchronously thirty to eighty times a second that means that they're really integrated with each other and that supports that sense of wholeness and integration that develops over time with meditation. Traditionally sometimes it's called as a factor unification of consciousness, singleness of mind, that's another result from long term practice. And then the last result I'll just mention here, in addition to more bodily results, increasing the immune system, calming down the stress response, faster recovery from being upset, that's kind of the body altogether. Just in terms of the brain, there are these little rigids at the ends, if you will, of DNA molecules called telomeres, and telomeres, sometimes also pronounced teelomeres but I'll say telomeres, they get shorter as we get older, I don't know about you, but I'm actually getting older, who knew right? And as we get older telomeres shrink and as they shrink we become more vulnerable to age related illnesses of various kinds. Well, some recent findings have shown that meditative practice helps protect telomere planks, these strips of atoms on the end of a super complicated molecule of DNA, so that we're more able to go into old age you know gracefully and living well. You know it's interesting, if the great pharmaceutical companies, great in terms of size, <inaudible 0:17:43.4> findings and whatnot, if they could patent meditation, already based on the proven health benefits of meditation, we'd be seeing ads for meditation every night on television and arguably even more ads than we're seeing for anti-depressants and other things. I don't know if they ever placed the Viagra ads etc., but we'd be seeing tons and tons of ads for meditation because of absolutely solid evidence for its benefits for physical and mental health.

[0:18:12.0] Fleet: It could be all day just to talk about <inaudible 0:18:15.7> else, but the science is really showing that if it could be put in a pill, we'd be investing billions of dollars in it, there's no question.

[0:18:23.0] Rick: Exactly right, yeah.

[0:18:24.5] Fleet: So in terms of attention, as you've mentioned in <inaudible 0:18:30.5> to, we do pay attention to threats, to things that are alarming, we know that our media is full of negativity. I know you've been home for a sum of popularising this idea by two researchers, I think at the University of Pennsylvania called the negativity bias. Could you talk a little about that and how attention is related to the formation of that and what we can do about that?

[0:18:56.0] Rick: That's right, people who are interested in this can just google the term negativity bias, they'll pull up probably scores and scores of references, including a really nice literature review that I'm fond of because it's well written, unlike a lot of papers, in you know social science research, it's called Bad Is Stronger Than Good. And it's this very basic idea that makes complete sense intuitively, think about it at a personal level, at your work ten things happen in a day, nine are positive, one is negative, what's the one you tend to think about and talk about or you obsess about as you're falling asleep? Or your boss gives you a performance review, nineteen points of praise, one out of twenty room for improvement, again, what's the one you think about? It's the bad news right, and that makes sense in evolution because as our ancestors were evolving for over three and a half billion years, especially the last six hundred and fifty million years as multi-cell creatures and especially the last six hundred million years of the evolution of the nervous system, which includes of course the development of mammals and then primates, hominids, appear the humans and us. Down the long run our ancestors have had to both get carrots, you know food, mating opportunities, etc. and they needed to avoid sticks like predators, natural hazards or aggression inside their band or between bands, both are

important, but if you fail to get a carrot today you'll have a chance to one tomorrow, but if you fail to avoid that stick today, whack, no more carrots forever. So we have a brain, to your point about attention that routinely does five things which creates the sixth. One, we scan for bad news, outside us and inside us, tracking the state of the body, what's going on in the psyche, what's the bad news? What's the bad news? Right, two, when we find the bad news we over focus upon it, that's why theories of positive emotion start with the word broaden, because when we experience emotionally positive moments, we tend to broaden to see the whole field of awareness, but when there's something negative, when there's one tile in the mosaic of reality, including our inner body sensations or mental activity that starts flashing red, that's spotlight of attention, it zeroes down upon it, there you go. Third, we overreact to that flashing red light, if you play two sounds for people in an MRI, one is pleasant, one is unpleasant but both are equally intense, equally loud, the brain reacts more to the unpleasant one. And then fourth, that whole negative package is fast tracked into memory, especially emotional memory, somatic memory, body memory, social memory. Once burnt, twice shy, we remember negative information about others more than positive information, a few experiences of helplessness are really hard to undo, we need many many times of positive experiences of efficacy and agency to overcome those things, to feel more like a hammer and less like a nail as we go through life. And then the fifth thing that the brain does, a vicious cycle develops in which the stress hormone cortisol, released when we're irritated or stuck in traffic or you know dealing with a siblings quarrel or we see somebody on the news who's politics bothers us, something happens, that stress hormone cortisol goes up into the brain where it turbo charges the alarm bell of nebula of the brain and gradually weakens and even kills neurons in a nearby part of the brain, the hippocampus which I mentioned earlier that calms down the nebula, puts things in context and also tells the hypothalamus to quit calling for stress hormones, enough already. This means that stressful, upsetting experiences today, especially moderately or severely stressful reactivating experiences today, make us more prone to getting upset the day after tomorrow, which makes us even more prone to getting upset the day after that. And then meanwhile, number six, we create vicious cycles in our relationships with other people. That's the negativity of the bias of the brain, which makes it as I say like Velcro for the bad but Teflon for the good. That's designed by evolution, it's not our fault, it worked back in the Serengeti, it may work today on a battlefield or if you grow up in a home that feels like a battlefield, but for most people, because mother nature's tilted toward survival but not quality of life, it functions as a kind of well-intended warning disability, because we've got a brain designed for peak performance in stone age conditions and as a result it creates a lot of excess suffering and conflict and harm. So, finishing here, if we tilt toward the genuine, factually based good news in life, the good news in the world around us, flowers are blooming, someone is happy somewhere, today no bomb went off in my pizza parlour, someone likes me at the deli or the coffee shop, I got an email done, I can recognise some goodness in myself, not positive thinking, I don't believe in that. Not high in the sky and never denying what is actually problematic or harmful, painful or bad, quote unquote, in reality, but tilting toward the positive to correct the response, to just level the playing field, and also because, as we'll get into, when you tilt toward the objectively valid beneficial good moment smiles, you have an opportunity then, because that's where your attention is resting, to take that good into yourself and thereby build up resources inside like compassion or mindfulness or kindness or self-compassion or grit, resilience, commitment to exercise, commitment to justice, commitment to your sobriety, feelings of self-worth, feelings of unconditional wellbeing no matter what the conditions of the world are around you, you build up those resources inside yourself by resting your attention on beneficial experiences, most of which are at least mildly enjoyable and thereby you correct for this bias and grow resources inside yourself just in the flunk of everyday life.

[0:25:25.9] Fleet: Wow, pretty compelling argument for really taking more responsibility or ownership over what we do with our attention, if we're predisposed to fill up our long term memory with danger, discomfort, negativity and that kind of focus, it seems like we began to put our hands on the string a little bit. But maybe we can talk a bit about how we could do that in terms of quality of attention, the relation between attention and relaxation which we got to refer to, from <inaudible 0:25:57.4> we talked about how mind training of mindfulness can increase the <inaudible 0:26:02.5> bilateral focus can increase the <inaudible 0:26:04.3> activity, which allows high speed integration, but at the same time I've often heard that relaxation is associated with slower brainwaves, the delta and beta kind of brainwaves, so what is this whole relationship to... there's a tension right, well what about <inaudible 0:26:24.0> and how does that relate to relaxation?

[0:26:26.2] Rick: Yeah, that's really great. So a few key points there, the first is that nothing that we're talking about here, as you well know, is about denying or minimising or resisting what's painful or challenging or difficult. The whole question really is what's our relationship to it, and if we are feeling pain in the body, or irritated or hurt or we are worried about something, the question is, are you getting glued to that movie right, are you stuck to the screen? Then you are reinforcing it in your brain. On the other hand, are you able to step back from it, witness it, recognise it, gradually tease apart the elements of that experience, are you able to hold it in a space of self-compassion and acceptance, are you able to put in a kind of inner shock absorber so you don't react too quickly and pour gasoline on that fire? Are you able to sense down into deeper, younger, more vulnerable layers of yourself, uncovering them, including them and accepting them? Are you able to do that in a relatively untroubled way? Then you're not reinforcing the negative, and if anything what you're doing is associating to it, I call it linking, you are associating to the negative of the pain, the sorrow, the difficulty, the anger, the desire to get hammered yet again tonight or finish the whole bag of cookies, whatever or yell at the kids, what have you, you're not reinforcing it, you're actually associating the difficult negative stuff to untroubled, spacious, open awareness. Awareness itself is never disturbed by what it represents, and that's the first point. The second point is that we build resources inside ourselves through cultivation. I think that practice really is like a three legged stool that has three fundamental compounds to it, warm heartedness, mindfulness and cultivation, in traditional terms, the language of early Buddhism, <inaudible 0:28:41.5> and many people have only two legs or even just one leg to the stool, and we really need all three, we need to have a warm heartedness for ourselves and others, we need to sustain mindfulness when we recognise what in the world's going on, we need to learn from our experiences, we need to develop and heal and transform and grow in the path of awakening, if it's only the growth of encovering awakened consciousness, or the nature of the divine perhaps that was always already there. In any case, it is a process of cultivation, so for me all three are involved and in terms of our focus here on regulating attention and part to grow the good inside ourselves depending on where it rests, we grow the good a lot to deal with the bad, in other words the more challenged our life is frankly, the more your life sucks, the more important it is to get control over your attention, rest it on things that are authentically beneficial and then really really really take them inside yourself. So, all that said, relaxation. Relaxation really supports that quality of spacious awareness that I was describing in the very beginning, where we're not directly making wise efforts in our mind, we're not trying to nudge the contents of consciousness in one way or another, but we really are trying to sustain the capacity to just really be with what's there, to feel it, as <inaudible 0:30:11.6> says to bear it and one thing that really helps us to do that is to calm the body, if the body's agitated, not relaxed, that tends to release more stress hormones, maybe get more agitated, naturally our attention is more skittery, because our animal, our non-human animal ancestors really needed to have skittery, vigilant attention when they were

feeling you know bothered by things. And so, if you calm the body, you're much more able to sustain that spacious awareness and in your brain, you're right, you do shift brainwave patterns, you know brainwaves, we are having multiple kinds of brainwaves at the same time. Some coalitions of synapses are hooking up more slowly, your alpha wave type activities, say, whereas other coalitions of synapses, and we have several hundred trillion synapses inside our brain, amazing right, other coalitions of synapses are hooked up in a gamma wave place and as an internal experiment, people might have already had a sense of this in meditation or in other practices where you feel utterly integrated, present and strong, and your breathing is slow, your body is very relaxed, but you're highly alert. You feel really integrated and often awash in a kind of contented tranquillity. So in other words all that can be happening at once and more and more I think, just to finish here, to quote <inaudible 0:32:03.5> a great meditation teacher, the purpose of practice is to expand the range of experiences in which we are free. It's easy to have that feeling of tranquil strength that's contented, right, when everything's going great, when they're fluffing your hair and feeding you cookies and painting your toenails, I've never had my toenails painted, but I'm sure it's a pretty cool experience, like that's easy, but can you stay in that place of calm, contented strength when you're in an argument with your teenager or you've gotten bad news from a doctor or you've gotten a black boarded letter from the IRS, who knows right, can you stay in the zone? I think that's what people do who are serious and deep in their practice, they repeatedly internalise learning experiences, getting regulation over attention and then using that as a super power to grow other super powers, of loving kindness inside themselves, equanimity inside themselves, joy or bliss or rapture inside themselves as factors of awakening. And so then over time, whether they're working for social justice, we can think of examples right there, you know Nelson Mandela, the Dalai Lama, <inaudible 0:33:22.6>, or other less known examples. People are more and more able to deal with challenges in life, in part, finishing here using the metaphor of the sailboat, because they've gradually deepened the keel, through their practice of mindfulness which begins, as you're doing here, with The Science of Meditation and related practices of mindfulness. That's where we start to deepen and grow the keel in our water so that we can bear more greatly, as Brené Brown puts it, we can go out into the deep dark blue because we trust our own deepening keel and as the winds of life blow you know they bang on us one way or another, but then we can recover a lot more quickly.

[0:34:04.9] Fleet: Staying with this discussion of attention and relaxation, let me cast a question rather this way, we've been kind of alluding to this capacity of simply being with what is and being in a more optimally responsive state to what is, <inaudible 0:34:22.1> of the old Zen adage to this idea of kind of going with the flow, so when I'm hungry I eat, when I'm tired I sleep, just kind of going with the flow of life, you know really connect with relaxation as well so the idea that we're actually present and awake in doing so. At the same time it seems like we could talk about mindfulness and attention as a kind of mind training, it could really go in the direction of greater mastery over the reign or greater better self-mastery, the ability to really design our life or you know I want to achieve great things so it seems like on the one hand there could be this intentionality of attention where you're somewhat of a <inaudible 0:35:01.6> towards the sky, almost sort of super human powers of attention and focus and accompaniment, or this idea of relaxing and being with life as it is.

[0:35:12.0] Rick: It's a beautiful question, you know frankly on the one hand a lot of the people who teach all just relax and just drop into who you are, they say that from the perspective of thirty years of practice you know and for a lot of people if they just go with the flow, you know, they yell at the kids, they kick the dog and they bang down a six-pack while they're channel surfing, so you know on the one hand I think our deepest nature is our Buddha nature you know, I think there's a lot of evidence for that, I mean we can talk maybe more about that, on the other hand we have a lot of habitual tendencies to tilt negative, the negativity bias, or we've

acquired yearning through painful experiences, growing up in different situations, going to school in different situations, or living in a culture that has a drivenness to it and a craziness to it, but it lacks a lot of the traditional forms of community and social support that helped buffer the challenges of life in times past, so for me, both are true. One aspect of practice is just sitting, <inaudible 0:36:26.7> in Zen would say, just sitting, just resting, utterly accepting, utterly present, but to be able to do that for more than a breath or two, you've got to grow resources inside yourself, because for most people that's a very unnatural thing to do for more than a breath or two, I think there are way of being so you can just bomb, completely drop, but for most people to be able to just rest in that way they need to train in mindfulness and in meditation like we're talking about here, they need to build up resting state relaxation or the capacity to recover rapidly to a state of resting state relaxation. First they need to build up a warm heartedness toward themselves and a way to, a capacity to relate to their drives, to their needs and their desires in a way that doesn't hijack that, it's no accident that the second truth is the ways in which suffering is caused by craving, and craving is caused by the neuropsychological-neurobiological framework by a sense of disturbance or deficit inside, rather than balance and <inaudible 0:37:39.4>. And so to your larger point, I think that there's in practice, a place for improving our perception, so that in real time we can be mindful of more and more details of our experience, more and more able to track impermanence and real-time, more and more able to track the interdependent arising of things in real-time, that's why training in concentration and some of your I believe presenters will get into is really really important because then you really really, you turn that spotlight into a laser and you can really see what's going on. So there's a place for that, but on the other hand I think there are a lot of modern practitioners, especially in the west, that have underemphasised the motivational aspects of practicing, parts that have to do with drives, or needs, or goals, you know how we lean into the next moment or where we come from as the next moment lands upon us and again the Buddha really emphasised, we have the four noble truths, they're essentially his drive theory of suffering, there's nothing metaphysical or supernatural in any one of those four noble truths. They are really down to earth and so I've been very interested is, I think you've been kind of implying in your question here getting at this, I've been very interested in how we can really face our craving nature, including subtleties of craving. You know, subtle forms of anxiety in terms of our needs for safety, subtle forms of drivenness, looking for something new to want in terms of our needs for satisfaction and also subtle forms of resentment and <inaudible 0:39:17.3> and clinging, having to do with our fundamental needs for connection and through repeated practice of stabilising and resting your attention, keeping those neurons firing together on authentic moments over experiences of broadly defined safety, satisfaction and connection you're repeatedly internalising those wholesome experiences in yourself, to practice, as I explore a lot, taking in the good, staying with the experience, absorbing it into yourself, even linking it to some relevant, related, negative material that it's the natural antidote for, as you repeatedly do that over and over and over again, combined with related practices of perception and insight, you gradually become less and less driven by craving, those forces inside your very real animal body calm down and instead, more and more you can meet challenges to safety or satisfaction or connection from a place in which you feel already peaceful and contented and loving inside, even when the world is difficult, but you can't do that as we're talking about here unless you get some control over your attention, unless you develop your mindfulness.

[0:40:32.21] Fleet: So without mindfulness and wakefulness that mindfulness can support, going with the flow can very much just be governed by our conditioned impulse or even instinct to <inaudible 0:40:44.8> seek pleasure and comfort in a very unconscious way, and it seems in the beginning I think for most of us as beginning mindfulness and meditation practitioners, we

need a more structured technique where we're placing our attention on an object of mindfulness whether it's the breath or the body or whatever it might be, noticing when it wanders, bringing it back again and again and again, exercising like we were also talking about, but over time that capacity can maybe rest in a less structured kind of awareness, a pure awareness or a present moment of attention. Maybe you could say something about that in terms of the science of meditation training and whether we bring an altruistic modelling to that or not, if you know that's the hallmark of the <inaudible 0:41:27.9> traditions but of course its thereby all Buddhist traditions include that altruistic motivation. So do we know scientifically a difference between simply training our attention, training our focus or when we bring an altruistic motivation to doing the same?

[0:41:42.2] Rick: That's a very interesting question. The first thing is that to be able to sustain present moment awareness, which is I think the fundamental traditional as well definition of mindfulness, sustain present moment awareness of both the inner and the outer world, just because mindfulness does not mean simply self-awareness, it means awareness altogether, okay. To be able to do that is not that easy, as many people have noticed, breath, breath, shopping list, right, so there is good research as well as common sense experience to show us that as you increase warm heartedness, your own warm heartedness for other beings, as you increase your own benevolent attention or also as you feel that you are receiving more warm heartedness, love is love, when there's flowing in or flowing out, do you feel more connected to others as you feel more embedded in a social field, as you feel that you're practicing not just for your own sake but also for others, and also as you apply that warm heartedness to yourself, as you bring caring and kindness and friendliness, the root of the word for <inaudible 0:43:00.4> loving kindness in <inaudible 0:43:02.3> is friendship, you should bring simple friendliness to yourself you become much more able to downregulate stress, which drives skittery attention and therefore you become more mindful, you also become much more resourced inside through these social experiences, these relational experiences of feeling loved and loving can become more resourced inside and therefore more able to tolerate the painful difficult, challenging things that sometimes surface in consciousness and thereby become more able to sustain mindfulness. And third, since feeling loved and loving is rewarding, you start to do two things, one you start associating rewarding feelings of warm heartedness with what could be fairly cool or neutral, mindfulness or attention or metacognition, attention to attention, so now you've got more associated to that so your brain is actually more inclined to be motivated in that direction and <inaudible 0:44:06.1> and as you experience reward, being part to these social experiences that were talking about warm heartedness, practicing for the sake of others, cultivating mindfulness as well as related results such as wisdom inside ourselves for the sake of all beings, as you do that, as you experience the rewards of doing that, you increase neuroplasticity, you actually increase the tendency of your nervous system to learn from the experiences it's having, you increase the livelihood through flows of dopamine and related neurotransmitter hormone norepinephrine which also tends to rise as we feel rewarded, but really with more positive emotion, when we get more dopamine and norepinephrine, as you do that you increase the likelihood that you will actually cultivate the fruits of your own practice it hardwired into, embedded into lasting neural structure and function. Isn't that great?

[0:45:06.7] Fleet: It's celebrate the learning process.

[0:45:10.4] Rick: Yeah, you steepen your learning curve, you help your nervous system become more responsive in a wonderful positive cycle, so being mindful with a heart oriented quality, yesterday makes you more able to learn from your experience as today and grow you own mindfulness and warm heartedness as well, which makes you really you know responsive to

your experiences tomorrow, so you actually steepen your learning curve, going through your life in a curval linear way.

[0:45:40.4] Fleet: So over time its valued presence in our lives and with others it has these elements of mindfulness and warm heartedness and attentiveness and so forth actually becomes self-sustaining in a certain way.

[0:45:52.7] Rick: That's right, that's right. I think, I know we're going to be finishing pretty soon and I definitely want to slip in if I could a couple of sayings there, traditional sayings. The first one, gosh, you would probably know better than I which of the great Tibetan masters, the early masters said it, I think it was <inaudible 0:46:13.4> one of them, he said, looking back on his life toward the end of his life, a life of serious practice, he said "In the beginning nothing came, in the middle nothing stayed, in the end nothing left." It fully cultivated, fully transformed, fully removed the obscuration to true nature along the way, and I think that's what we're talking about here, that's a beautiful way for me at least you know to describe the path of practice and it also applies to different aspects of practice, for now I think it's trying to say that there's a lot that doesn't leave, I'm not fully awakened but there's certain qualities of mind, while simultaneously there are definite things I'm continuing to work on to try to help them stay and there's certain things that no matter how hard I try are still not coming into the mind stream and I'm really working on those, so that's the first saying. The second saying is from Tibet as well although you find it elsewhere around the world, "If you take care of the minutes the years will take care of themselves." And I think that for me what's the most important minute of your life? It's the next one. The minutes in the past are gone, this moment as it is is already what it is, you can't do anything about it but the next minute after minute after minute is full of opportunity. Will we rest our attention? Will we get control of our attention with regard to the next minute so that it's not hijacked by silly stuff or distractions or internal rumination, looping, and will we be able to, in the next minute, rest our attention on what's wholesome and thereby gradually drawing it into ourselves. That's the fundamental opportunity and it's our responsibility, each one of us, to grow our mindfulness so we're more able to make use of, productively, the most important minute of our life, minute after minute after minute. And then if I could close, I want to quote the Buddha here if that's all right, in the Dhammapada, it's perhaps my favourite teaching, he says "Think not lightly of good, saying it will not come to me. Drop by drop is the water pot filled, likewise the wise one gathering it little by little, fills himself with good." And if I could add, certainly implicit and often explicit it is on teaching, as we fill ourselves with good, we do that for our own sake, that's perfectly fine and appropriate, but we also do it for the sake of all beings, known and unknown, the great and the small, omitting nothing.

[0:49:07.6] Fleet: What a wonderful place to bring our conversation to a close, thank you so much, this is just a fabulous beginning to our exploration of the science of meditation and mindfulness, beginning with where we all began, with training our attention and understanding a great deal more about this so this has been a great kick-off and I'm sure will inspire a lot of the dialogues that will happen with our other teachers so we're going to be presenting <inaudible 0:49:32.8> so thank you so much.

[0:49:35.0] Rick: It's an honour to be here, I wish everyone well in this program and remember that those little minutes, those little moments, adding up over time can make a really big difference to your day and then your week, your year and your life.

[0:49:48.1] Fleet: Well I really encourage all of our audience to check out the Well Spring Institute, is that what it's called? To learn more about what <inaudible 0:49:59.4>