Transcript: Sleep Junkies Podcast Episode 010

Hacking light for optimal sleep and circadian biology - Thaddeus Owen

https://sleepjunkies.com/hacking-light-for-optimal-sleep/

1:29 Jeff Mann Good morning everyone. I'm joined on the other end of the line with Thaddeus Owen. Good morning Thaddeus. Good morning Jeff. Happy to be here. Great. Just remind me why you are again. Because it's very early where you are - it's 11 thirty a.m. here.

1:44 Thaddeus Owen It's 5 thirty am here, I am in Wisconsin which is in the upper Midwest of the United States.

1:49 Jeff Mann Fantastic. Okay. Well I'm really looking forward to hearing what you've got to say and exploring this topic today because we're going to talk about hacking. Not hacking computers. We're going to talk about biohacking and specifically light hacking ,which some of you may be scratching your heads and thinking 'what on earth is that'.

We've got just the man to talk about it. So Thaddeus, why don't I just hand over to you. Give us a bit of a background, well tell us what biohacking is ,how you got into it.

02:22 Thaddeus Owen Absolutely. So. Thanks Jeff. I am going to talk about light hacking and that's a subset of biohacking but my opinion the most important and often missed part of biohacking and optimal human health is the light part and that's what we're going to dig into today.

So it took me a long time to get there. When I first found biohacking it was about 10 years ago. And so what most people may or may not be aware of is the kind of term biohacking was invented or coined by Dave Asprey about 2005.

So he is of course the founder of Bulletproof. He's the Bulletproof Executive. And I did study and train with Dave for a period of time as a bullet proof coach and some other things. So he kind of coined this term but it's it's bigger than just Dave aspirin bullet proof of course where bio hacking essentially means taking control of your own biology. So we kind of own ourselves, we're the CEO of our own health and of ourselves.

And if that is true and we want optimal health it is something we can take upon ourselves to modify the environment that's around us. So our home our light environment, the food that we eat and the environment inside of us using the latest science but also, my opinion, ancient practices.

So what have humans been doing forever that works really well that we've gotten away from in our indoor life. And what is the latest science showing that we can incorporate into our lifestyle into our bodies into our mind to make us optimally healthy and not just of average health.

And so biohacking explores these realms. Of science based and then natural ancestral practice and applies them. So instead of just learning about it we apply it in our own lives. And experiment on ourselves and figure out did it really work for me and then hopefully tell others what worked and what didn't work and make the world a better place.

04:23 Jeff Mann Great great. Just to delve a little bit deeper into that. So biohacking it's kind of related to this, you know this craze we had for the Quantified Self where people were tracking and measuring their you know, their vital stats their food and their sleep and their fitness and Dave Asprey as as you said coined the term biohacking and there's quite a wide range of biohackers isn't that there's some quite extreme stuff in there and this stuff which is quite reasonable. It's kind of science and research based but also practice based as you said isn't it.

04:59 Thaddeus Owen Yeah and so I come at it from a slightly different way than some people and yes there are the people that are looking at how to optimize our biology and there's others that want to look at our biology and figure out kind of the tricks and hacks to modify our biology to help us live longer.

So Dave Asprey wants to live to be 180. I don't know if that's changed now I haven't followed him in quite some time as I've been diving into this light for the last couple of years but that's absolutely true as some people want to enhance their biology sometimes with implanted things with other drugs potentially.

So my background of course is, I spent 10 years developing pharmaceutical products. And so I'm very aware of this kind of pharmaceutical, biological change and the unfortunate part about pharmaceuticals is when we invent synthetic compounds in order to process them when we make them synthetic they tend to not be the same molecules that nature would invent.

And in fact when that happens you know everything that your body produces everything that you are that is a part of you, does interact with light which we'll get into. But when you create a pharmaceutical molecule it's slightly different than what nature would make it interacts with light in an incorrect way which is why you get all these side effects from pharmaceuticals.

So I spent 10 years developing these pharmaceuticals. My background is chemical engineer thing and then I've got a master's degree in holistic nutrition and my kind of breaking point was standing in this giant pharmaceutical plant. So I worked for a pharmaceutical company that is the largest over-the-counter pharmaceutical. It's not a branded name. So we would make the target the Wal-Mart the Walgreen all these large brands we would make all their products for them and put their labels.

6:53 Jeff Mann Basically you are concocting the ingredients for all of these big name brands and we won't mention names...

7:01 Thaddeus Owen Yes I was developing pharmaceuticals as a generic company. So we would put whoever's label on it that wanted to buy it. So very big brands all over the world. And we were the largest pharmaceutical company doing this.

And I was standing at the top of a ten thousand gallon batch of children's pharmaceutical product and dumping in a fiber pack drum. So I was developing the manufacturing processes for these huge scales.

And the drum I was pouring in had a big skull and crossbones on it. Poison carcinogen. I'm wearing a full respirator, a Tyvek suit and all the people that are working on this batch all the workers are wearing respirators and here we are pouring poison skull and crossbones carcinogens into a children's product that's supposed to be making them healthier and that was my breaking point where I just I could not do that.

07:49 Jeff Mann It's kind of like Breaking Bad, but you're making it for kids..... And then you decided, 'what am I doing'. And you thought, 'I'm going to take a different path.'

07:59 Thaddeus Owen I took an absolutely different path. I actually left the company within two weeks after that and started a new job in environmental sustainability.

And what that allowed me to do is to interact with a lot of people all over the world all of our customers that cared about sustainability and health. And it allowed me time as well to research and dive deep into why are we doing all of these things in pharmaceuticals and with our bodies that aren't appropriate from a natural standpoint.

And I studied over the last 12 years now so it's been 12 years that I left that job and have been studying what is now called biohacking. At the time I didn't know that that was the term until about nine or 10 years ago.

But I started studying health, nutrition and how biology works and eventually found this pathway to light as maybe the most important biohack.

8:49 Jeff Mann So your company and your website Primal Hacker takes a slightly different approach to some of the other biohacking. I don't think you you were planning to live to be 180.

9:00 Thaddeus Owen Well if it happens it happens but I'm not doing stem cells and implanting injectables or anything else. So I'm basically we take we take the approach of course of looking at all the latest science because it's super important with everything that's coming out to look through and sort through those studies and actually do something with them.

Sometimes, the latest science will sit on the shelf as more research comes out and more research gets done and they they then have to replicate that research it can be 10 to 20 years before somebody does anything actionable with some of this brand new data.

So we love to study that of course. But also ancient practices. So humans have been around for quite some time. There are things that the body has been designed to do over those times.

And if we get away from that in our modern lifestyle we can create disease and all sorts of other problems. And so understanding that with how to mold an modern indoor life is very critical, in my opinion to optimal health and so we try to combine kind of these two philosophies of ancient practices and new age, new science.

10:04 Jeff Mann Yeah it's one of the reasons I got in touch with you Thaddeus because the Sleep Junkies we're very much into the idea that we've kind of lost touch with nature through modern lifestyles, modern living and sleep has suffered as a consequence.

And you're coming through this this approach of ancestral health. I was looking at your Instagram and as you said biohacking covers not just sleep, it's diet and exercise and lifestyle as well. I saw you jumping in some some ice holes in the lake.

10:33 Thaddeus Owen Oh yes . So obviously my key to biohacking and in my life is light and there are so many more practices of course that I've learned over the years to make humans optimally healthy.

I do live in a very cold northern latitude and if I'm going to do that my opinion for everyone here is that why dread the cold and be miserable all winter long when you can embrace the cold and do what's called cold adaptation which humans are designed to do living through ice ages.

We have certain mechanisms in our body to adapt to these cold environments and it may not seem fun and it may not be comfortable for the first few times but there is some really compelling research that shows dunking yourself in cold water, for three to five sessions of only a couple minutes a piece cold adapts the for up to 14 months,

And that means you have, based on the research a 40 percent less strong response to cold. So basically your cold response is dimmed by about 40 percent. So think when it's winter and it's cold and this miserable and everyone's bundling up and you can just surrender and be OK with the cold because your body is very unaffected by it. So to me that is something that we can look forward to in the winter and deal with and we don't have to do it every single day.

But if we cold adapt over a very short period of time it can have benefits for a very long time.

12:01 Jeff Mann We've got companies now in Silicon Valley haven't we where people jumping into giant freezers in their lunch break, getting big funding for doing this cryotherapy. I'm not quite sure of the term. Not directly related to sleep but I can totally see the connection between you know just general health

12:22 Thaddeus Owen There's there's a there's actually some connection to sleep because it is called cryotherapy and many people are paying seventy five to a hundred dollars per session of a two minute session to four minute session of cryotherapy.

And my argument is you know in the West Coast you can go jump in the ocean because it is the exact perfect temperature for a cold thermogenesis or you can, in the northern latitude literally just walk outside and it's completely free.

And so what what I've been told and what I have found is cryotherapy or cold adaptation improves people's sleep in a very noticeable and measurable way. And so if you're able to do this one of the listed benefits and you can look up some research on cold adaptation and cold thermogenesis, one of those benefits is increased sleep.

13:10 Jeff Mann OK. Good segue. Well let's talk about this subject of light hacking talked about the background for biohacking. You did a TED talk on this recently. Was it last year or the year before.

13:24 Thaddeus Owen Yes two years ago at this point. So almost exactly two years ago. And that was my first as I said I've been studying light about two years. So that was my first foray into understanding how important light was doing a whole bunch of research.

So all the research I did for the TED talk was published research papers on sleep and circadian biology specifically looking at frequencies of blue the color blue after dark.

And there's tons of tons of research out there are thousands of studies now on the link. Between what some people refer to as artificial light at night ALAN and incidence of disease, cancer, heart disease diabetes obesity and cardiovascular disease.

And I I was blown away. I didn't know that that was out there I had no idea that those studies existed and there were so many studies from from years and years of research that I had never heard of.

So I tried to piece all that together and was approached after some of my Instagram Stories by a committee that ran TED talks a little north of me and they asked if I would present on that exact topic and I believe it was really well received here and then that's led me to just dive deeper and deeper into the light aspect of sleep and health.

14:40 Jeff Mann Yeah. There's also this aspect of circadian disruption as well which is related but we'd end up talking all day if we were to go around this subject so I want to break it down quite simply into these two areas of light exposure in the morning as an issue and then we've got stopping and blocking blue light exposure at night. Let's start with the morning.

15:05 Thaddeus Owen Yeah. So there's there's a refining point here and it's it's hard for some people based on your work schedule based on your sleep schedule but I'm gonna give you the keys and then you have to figure out how to use them for yourself and the keys are;

Within 30 to 60 minutes of sunrise is the perfect time the absolute best time to be out if you're gonna say what is what can I do for my health - the ultimate health hack it has to do with light and it has to do with getting an in the sun as naked as possible with as much skin as you can exposed within 60 minutes of sunrise preferably within 30 minutes.

And there is a reason. And this is not debated, but the sun when it rises has no ultraviolet light in it. So you are exposed to red, blue, green infrared all these frequencies of light without the ultraviolet light. And what this does is a number of things.

But the critical things are when it comes in through your eye - so you do not want to wear glasses contacts or sunglasses. I'm not telling you to stare at the sun you actually want to walk about 15 degrees away.

But if you even look away from the sun completely you're still getting those light frequencies into your eye and skin. But there are these wavelengths of light in the sun that in the morning without the UV, do things like stimulate hormone production and neurotransmitter production. [00:16:26.73]

So beta endorphins, dopamine and then the two amino acids that are programmed by the sun in the morning to set your circadian biology are tyrosine and tryptophan. So we're not going to talk through the details but essentially those become melatonin, serotonin and some other compounds in the body they're going to set your circadian rhythm by the day for the day by being programmed by that morning light without the ultraviolet in it.

And that morning light has a certain amount of red and a certain amount of blue that is received by your eyes and it tells your body what time of day it is by the fact that there is no UV and there is a certain kind of blue and red.

Throughout the day the amount of blue and red shifts and the amount of ultraviolet light gets stronger until solar noon and then gets weaker until sunset when it disappears again [00:17:16.37].

And your body has receptors to identify all of those things going on and set circadian biology, produce the right hormones so you build melatonin in the morning.

That's the hormone of darkness the hormone of sleep but it is built in morning sunlight. And so if you're not in morning sunlight you're really not building your stores and programming your melatonin to do its job at night.

So very very important. The other thing that it does. Some people are very fair skin whether your fair skin or not. Morning sunlight - and this is again lots of studies that show this - feeds red light into your body which reduces the effect of ultraviolet light later in the day.

So it basically preconditions your skin for ultraviolet light. So if you burn when you're out at noontime sun, precondition or your skin with morning sunlight and you can absorb far more UVB before you have any damage to your skin whatsoever.

And in fact I did this over the last summer. My girlfriend and I programmed our skin in the morning. We preconditioned it every morning literally every morning with as few clothes on as possible for at least 10 minutes sometimes a half hour and then we would spend eight to 10 hours in full sun and net we never burned.

When we took a walk in New York City for four hours we were with two of our friends. They burned to a crisp. We were out for eight hours spent four hours with them. We didn't burn even a little bit. They burned within you know one hour and had to go back home and rest and lay down because they are so sore from their sunburn and we never burned the entire summer doing that.

So that practice is something where the literature says you can precondition your son your skin with morning sunlight. We tried it and it worked for us phenomenally well

19:05 Jeff Mann Going back to this biohacking thing again. This is the aspect of people using biohacking to do trials and experiments on a personal basis. But you know we have to say this is as a

caveat, this isn't a general recommendation to go out and do it. But these are the results that you found and I just want to say that because a lot of people out there with issues maybe skin issues.

19:30 Thaddeus Owen
Yes you do have to you know look at the research on your own and make your own decision about how you do it. I I am definitely presenting my experience.

However my experience is definitely based on what the literature states and they're there for people that are still a little bit afraid of the sunlight and are not quite sure what to think of, dermatologists recommendations vs. what the literature actually says, There is a really really brilliant article that was published January 5th or so this year.

So just a month ago or less in Outside magazine. So outsideonline.com is the online version of an Outside magazine. There was a brilliant article on sunlight and whether or not you should be in sunlight versus what the dermatologists are recommending and it presents the research and the researchers who have created a lot of the data.

It was very well written and easy to understand and you can kind of search for that article if you if you want to understand being out in the sun versus staying inside and covering up.

20:32 Jeff Mann Yeah yeah. No. Great. I'm personally very interested in this because I know we do have the skin has its own photo receptors.

20:42 Thaddeus Owen We know that there's melanopsin and neuropsin receptors in the eye. We've known that for many years. What we didn't know until literally 2017 was that there are melanopsin receptors in the skin the blood vessels and the subcutaneous fat that is brand literally brand new science that only came out within within the last year and two months.

And so because it is so new it tells us that our skin does have these light receptors. We didn't know that until very very recently.

21:10 Jeff Mann We're on the bleeding edge is is a good place to be.

21:13 Thaddeus Owen It's a fun place to be at least.

21:16 Jeff Mann OK. So some people may have heard some of that and they think Blimey that's an English expression by the way. He just said I need to get naked and go to do's. So how am I gonna do that in the middle of London.

21:31 Thaddeus Owen So there's that there's a couple of things going on here and one is yes you can absolutely be naked in downtown London at anytime of the day and I will tell you how

And so I I have neighbors and I am quote unquote naked every morning. And here's how here's how you do it. So I am of course more comfortable taking off my clothes than others so my shirt can come off a lot easier. However what you can do as a man or a woman is you go out and there is a really great European, it's actually based in the U.K. company called Kiniki with a K. And Kiniki makes bathing suits shorts t shirts and long sleeved shirts that are tan through.

They actually allow you to be naked out in the sunshine without actually being naked. So they allow the wavelengths and the frequencies of sunlight that are most important to come through their shorts t shirts and swimwear

So you can wear these and be completely clothed yet allowing the wavelengths and frequencies of light to penetrate through your clothes. So that's one way you can do it even in downtown London.

And I will say like even on a cloudy day. You still want to be outside you know to obtain the benefits of the circadian biology.

So just because the sun isn't shining that there's clouds or fog or rain you will still obtain the circadian benefits of being outside and programming your eye and your brain and the chemicals in. So the the lux levels, lux is basically a measure of intensity of light. So what's the intensity of light over a given area and how bright is that light.

You know that we measure it with our eyes essentially and that's like the brighter the light the higher the lux the dimmer the light the lower the lux.

So there's a scale and it goes from zero to infinity essentially. Indoor lighting so dim night like a dim nightlight, something that you'd have on in a hallway at night for children to find their way.

23:25 Jeff Mann Then I've got it here in front of you but carry on and your numbers will probably be you know I'll tell you....

23:31 Thaddeus Owen You can tell me the exact scale but essentially dim hallway light might be something like oh 10 or 20 lux at the at the most typically and then indoor lighting varies by home lighting an office lighting but you're at your office lighting let's let me I'm going to make a guess and compare it to sunlight you can tell me the actual numbers when we say office lighting is something like 5000 to 10000 lux and then sunlight outdoor is like one hundred thousand lux

23:56 Jeff Mann It's even more extreme than that. So candle light the base unit, a candle light is one meter away is 1 lux. Typical living room with no windows 100 lux Sunrise, 1000 lux and then a sunny day a 1000 thousand lux. So I mean that's that's incredible. And my point is we just don't realize how dim our indoor environments are a lot of the time compared to the lux levels that you get from outside

24:29 Thaddeus Owen It's a it's a bigger deal than most people think is that lux level because of how our body and our hormones is in our circadian rhythm as programmed by light and the other thing I want to make a point of that people aren't aware of.

You may work in an office like I do with tons of windows. And so it's natural daylight coming in and you think oh this is great the lux is very high I'm getting this natural daylight through the window while the window blocks the UV light but it also blocks 50 to 80 percent of the red and infrared light coming from the sun as well.

So in that indoor environment which we'll talk about in a minute you're you're losing a lot of wavelengths of light even if you're in front of windows and you're just getting the wavelengths of light that are coming from your indoor lighting which are very alien frequencies to the body.

So it's it's very important what Jeff is saying that being outdoor not just in front of a window not just under really intense indoor lighting it can make a really big difference.

25:25 Jeff Mann I mean this works even if it's cloudy. So the the differential between indoor and outdoor even on a cloudy day is massive. So even if your thinking is a grey day it's going to make it much difference if a guy does it will it will make a big difference.

But let's say there are no options, I don't know I haven't really asked you if you've explored any of this but there are some there are some ways we can you know hack our morning lights as well.

There are therapeutic ways to do this people who've suffered from depression and seasonal affective disorder for instance might be prescribed a course of light therapy which is an accepted clinical practice which involves a big bright full spectrum light that you sit in front of in the morning.

But there's been a lot of consumer orientated tech coming on board as well which is based around this idea of getting as much light as we can early in the morning and sunrise alarm clocks and light therapy glasses. Have you come across any of those.

26:24 Thaddeus Owen Yeah. So there's some glasses. The name is ReTimer on some of those glasses. There's probably some other types of glasses that shine light the glasses shine them directly under and up into your eyes.

And there's of course on Amazon and other places you can purchase sad or seasonal affective disorder lights. My opinion on those is they they can help with one thing and they they may be used with caution for others so they may help with increasing the lux and putting a bunch of blue light typically blue enhanced white light right into your eyes.

And they do work and they're very effective to wake you up and the way I think they're working is increasing cortisol and decreasing melatonin which is gonna make you more alert and make you more awake.

But ultimately we live in this indoor environment that is predominantly lit by blue light from our devices our televisions our fluorescent lights our LED lights everything emits these very strong wavelengths of blue. And to wake up and put more blue light into directly into your eyes your brain or onto your body I think can wake you up but I think the long term repercussions may be again too much blue light into your body and eyes without the complementary frequencies you would get in full spectrum sunlight.

So so my opinion is you always want to use nature first and of course it's free and it's your designed to work with that natural environment. When you start bringing in some of these light biohacks as we talked before there can be some downstream later effects that may not be accounted for based on long term use and how our environment has changed from using incandescent and halogen lights to now these very different LED and fluorescent lights.

So I think I have heard lots and lots of personal experimentation where those lights have been very effective and of course they are prescribed by medical professionals. I just think that long term all that blue light into your body may not be appropriate without being countered with some other wavelengths of light along with those lights.

So my suggestion would be use nature's gift which is our sunlight first. If you cannot do that and you need some of these light therapies I would really recommend looking into other wavelengths of light that can be used to complement those that you use and the SAD type lights.

28:50 Jeff Mann Yeah it makes perfect sense what you're saying sunlight. That's what we've lived with since year dot. Since we were walking around bashing saber tooth tigers over the head so ideally full spectrum light and if something has gone to a targeted frequency either blue light or green lights these ReTimer glasses maybe ,err with caution. I think that's good advice.

29:14 Thaddeus Owen Yeah I think it's that's part of the biohacking and experimentation - two hundred thousand years of humans living under nature's light. And now we live indoors. And so I think using some of these types of tools are important.

Because we did move ourselves from a lifetime to hundred thousand years of being outdoors to now indoors. We have to bring in some complementary technologies that are beneficial. We've we've really not looked at our light environment other than those that make things bright enough for me to see what I'm doing. And is it cheap does it use less energy.

And now we we have this alien light environment that is affecting us negatively. So things like the ReTimer glasses are interesting because they do use this green wavelength light which is a very interesting wavelength versus some of the others.

But it's important to experiment and to have us trying these things to overcome this indoor lifestyle. And we may be able to come up with a combination of lights that are very beneficial in an indoor environment.

We probably will never mimic sunlight but as we are so much indoors with our jobs and our homes it makes a big difference to experiment with different technologies, light technologies and see how they work for you.

30:24 Jeff Mann My approach in all this is to be to be open minded and not to be closed to any of these ideas but also be responsible and also do your own research as well and above all if you think you've got some serious condition, go and see your doctor or your health professional

Actually Thaddeus , what we didn't mention. Really interesting what you're saying about the way sunlight is almost like a code. It's got all of these different spectra and it's programming us for the day it's setting up synchronization and our alignments.

So as you say getting light in the morning, boom there's a synchronization signal but what you didn't mention as well, it also acts as this break for melatonin.

31:10 Thaddeus Owen Yeah. So that's very important is we turn on things like melatonin in the dark. So if you're not exposed to darkness you can't turn on melatonin.

Melatonin is sent out to the body to do its job in darkness and any amount of light, and typically the blue wavelength of light is most associated this, turns off the melatonin.

And that's a good thing. You want your body to turn it off in the morning and start producing cortisol to wake you up and to stop these hormones of sleep and rejuvenation because you're now in the middle of the day and you need to know whatever you need to do do your job, forage for food drive a car.

And so the light in the morning is blue light. There's there's never been throughout human history blue light after sunset. And so once the sun sets we've seen firelight we've seen moonlight but there's not really been any blue light.

And so when the blue light comes on in the morning it shuts off our melatonin. It says stop producing this hormone. It's done its job for the night. We need to start producing cortisol.

So cortisol and melatonin are opposite hormones. Once you stop producing melatonin you begin producing more cortisol and we start actually producing in that morning light before the movie comes in.

32:27 We start producing other hormones where we're programming thyroid hormone from tyrosine and we're programming serotonin and melatonin from tryptophan. And then when the ultraviolet light comes on. So sometimes that's within 30 minutes of sunrise and sometimes it's within about three hours of sunrise, we get this ultraviolet light, that shuts down the other hormones that you're producing like the serotonin like the that the thyroid hormone. Those get turned off.

So when we're missing these specific wavelengths of light our hormones are not able to sync up with how they should be functioning and in a normal human because we're continuously feeding our bodies a signal that it is noon in the middle of summer on the equator all the time with this massive blue light signal from our devices in our indoor lighting so our hormone panels can get wrong signal.

They get disinformation that really can lead to disaster down the road for many people.

33:25 Jeff Mann Okay. Last point on this morning thing. What about generally in the daytime. Let's say you had to go from your house and you took the lift down to the basement into your car and it's still dark and then you drive and then you take the metro. So all this time you're under artificial light and you don't see any daylight and then you take the elevator into the building. And from that time you've never been with any sunlight since the moment of waking up.

33:52 Thaddeus Owen Yeah, that happens especially here in a northern climate where people go like you said from there they're home to their garage to work to the store to the gym back home and they've never spent any time outside and that is very important.

So light and human biology work at a quantum level and what that means is tiny tiny doses of light have a massive massively beneficial effect on the body in the eye.

And that means that just brief amounts of light as brief as you can get if that's all you can do during the day really do have a very big effect. And how do you do that?

So you want to find ways to get yourself outside without your glasses or sunglasses so that you can actually see the wavelengths of light that are present truly and you know one way that you can do it is people maybe still do but less frequently go out and take smoke breaks for a couple minutes while you can take a quote unquote smoke break and just go outside and get some fresh air and some light and come back in.

So any excuse that you can find to get yourself outside you can open a window. So natural light coming through a window is very filtered and not the same light as what's outside. But can you open a window?

Now not everyone can in their office. Some people could open that window and even just a couple minutes get some of that natural light through the window and then close it down again.

But any time that you can get as much natural light as possible throughout the day on these little mini breaks because light works at a quantum level makes a massive benefit and difference to your body.

35:25 Jeff Mann Definitely. Loads and loads of research just to say that just doing that taking small breaks outside will increase mood increase productivity. Lots and lots of research.

One point on this. We've talked a lot about the the biological mechanisms in here but we haven't really mentioned why exactly that's so important too to sleep. We've talked around it essentially with synchronizing our circadian rhythms.

35:52 Thaddeus Owen Well yeah. Humans are our diurnal animals we we are designed whether you believe in a god or gods or evolution. You know we have been designed our biology is designed to work with the rotation of the earth.

So the Earth rotates and there are light and dark cycles of the earth and our bodies are designed to do certain things in light and other things in dark.

[00:36:18.58] What gives us the clue as to what the body should be doing when based on how it's designed are our our light environment. So if we have a light environment that is alien and indoor we get a different signal than how we were designed to use the light environment which has outdoor looking at the full spectrum of the sun where blue light is extremely beneficial in nature but it is always balanced by red and infrared from the sun.

And so those things provide the right stimulus to the body to know to get information to know what to do and this is where I think many people fail to understand that light is full of information that is imparted to our body. And it tells our body how to program the right hormones when for optimal health.

37:04 Jeff Mann Okay. Brilliant. That's light exposure in the daytime and in the morning. Let's move on now which is probably something that people are more familiar with and this idea of looking at the blue frequencies at night.

Can you just talk briefly you you have explained that a little bit but without going way way deep into the rabbit hole because this is a massive subject on it's own this idea of why blue light is something we want to minimize the nighttime.

37:32 Thaddeus Owen Yeah. And so when people hear blue light it's like well I don't I'm not around any blue light. But the the bottom line is your LED lights, your compact fluorescent lights, your screens on any of your devices, tablets, televisions use LED technology that if you look at a spectroscope or a spectrometer reading of that light coming out has very high amounts of blue wavelengths of light that all those LED chips are based on.

There is no red and no infrared. And the problem with that of course is that when we're indoor and at night throughout all of human history two hundred thousand years we never would have seen blue wavelengths of light at night.

We've seen firelight which sometimes can look blue but the amount of red and infrared is massive compared to a tiny tiny tiny and sometimes infinite small amount of blue. [00:38:28.46]

Same with candle light. Same thing very high red infrared almost no blue light. And so our body was designed to use blue light because it comes on in the morning and throughout the day to turn on these cortisol hormones and others so that if we are exposing our eyes or our skin to the wrong wavelength of light to blue light at night it increases our cortisol, decreases or turns off our melatonin release.

And so then we miss the benefits of sleep. We miss the benefits of the rejuvenation, the cleaning up of the damaged cells, the recycling of the mitochondria. All of that goes away when we're exposed to this wrong type of light at night just based on the way our biology has been designed. And so we have to be careful of the light environment at night if we want optimal sleep and to get the benefits of the rejuvenation of sleep.

39:21 Jeff Mann
So on the blue light thing. Let's talk about something is very in vogue at the moment which is blue light blocking glasses.

Now I'll tell you my take I've actually got a pair and I don't wear them every single night but if I'm working on the computer late at night I would put them on and my own biohacking experiments if you like, what I notice is that I don't feel the same propensity to stay up late

So something is going on when I'm feeling like when I'm wearing these blue looking glasses I just want to get to bed earlier.

But I think there's also in the press recently there's a lot of people who've jumped on this bandwagon of the popularity of these blue light glasses to do with other areas for instance, eye damage and macular degeneration and also eye strain on the computer.

Now my take is that for sleep and blocking blue light at night is unequivocal. The other issues I'm considering that the jury is still out with regards to things like wearing blue blockers in the daytime eye strain and for the eye damage. That's my personal take. What do you say about all that.

40:37 Thaddeus Owen
Yes. So I do wear blue blockers and have been for the last four years and I literally will not go a night without them. So they provided me personally with massive benefit for sleep and trust me when I tell you if you if you pair blue blockers with using red lights at night nobody in your house is gonna be able to stay at best seven thirty at night when it gets dark.

It's pretty impressive how how it does lead to sleep and a more natural time period.

During the day - this is somewhat controversial even in the well-known spheres where people that are super well studied in this. But essentially there is lots of data and this data is not opposed that blue light causes free radical damage in the eye.

The issue is like there's blue light in nature for sure. And so that's happening in nature anyway. Where I see it is blue light causes free radical damage red and infrared light clean up the free radical damage and in nature blue is always opposed by red there's always blue and red and infrared together always.

And so the stimulus to the eye with the blue and the creation of free radicals - free radicals aren't bad necessarily it's bad if you get too many and so free radicals still signal the body to do certain things.

And so the blue is there to signal the body through free radicals to do certain things and then those free radicals are then quenched or cleaned up by the red adn infrared light

When you are indoors on modern devices you are constantly receiving these spikes of blue light unopposed by red and infrared. So that is where we believe some of the problems of macular degeneration are coming from as well as the number one leading cancer of the eye is 100 percent correlated right now with blue light.

And so we believe that this massive amount of device use throughout our day with blue light unopposed by the red and infrared is the big problem. So there are certainly in my opinion I don't wear blue light blocking glasses during the day. But what I do is is I use a special app on my laptop to dial out the wavelength of blue on my laptop and I use a red light that shines toward me during the day when I'm on my device. So I get additional right and infrared light as well as a less blue light from my device.

xSo that mitigates in my opinion some of the effect of those too much blue light during the day.

43:02 Jeff Mann I read recently a scientists actually warning advising against blue blockers in the day it was just telling the story of a patient who had done that and they weren't getting adequate synchronization from external light because they weren't receiving the blue light signals and I think there were some issues with depressive illness as well.

43:25 Thaddeus Owen That's true and this is where people get too extreme like they think I've got to block blue light all the time. And certainly if you're in a windowless room on a device you should be probably be blocking a portion of the blue light spectrum, the most high intense one that causes the most free radical damage.

But you must take those off and get outside or by a window or something else too and train your circadian biology it's on it it sounded like you know the person you knew I was having some some issues with that as well.

43:52 Jeff Mann Yeah. Let's talk about these things you can use on your screens. I mean there's a few different apps you can use now. There's one called F.lux which I've used for over five years is this one called Iris.

It is built into most phones no I have got nNightshift. There's something on my Samsung phone a blue light filter. I don't think there's any damage at all is to having these these filters on all the time on your screens.

44:16 Thaddeus Owen
Yeah I never I never turned mine off unless I really have to do something critical in color so the blue light blocking apps on the phone and the devices the iPads any tablet and also on your laptop. I have those built in I have them turned on all the time so I personally used to use F.lux as well. I use Iris now. I purchased the full version of Iris back when it cost two dollars U.S. and I've got a lifetime subscription now for it and I have Iris on my phone.

44:46 Jeff Mann Sorry to interrupt because a lot of people are recommending Iris. Now if anyone's unaware that these two programs work on Macs or PCs and it just runs in the background and at nighttime it will reduce the blue spectrum light in your screen and your screen will gradually get more and more orange and red tones or you can have it on all day as Thaddeus does. But there's a new one called Iris which has come out recently and give me the pros and cons of both.

45:21Thaddeus Owen So Iris allows you to manually mess with, change the color of your screen and so to me the benefit of Iris is if you if you take a spectroscope which can measure all the wavelengths and intensities of light you can measure with F.lux that you still get quite a bit of blue light coming through the F.lux with Iris you get much less blue light on the same settings potentially but you can also do some really unique things with iris that I was not able to do with F.lux which is it has built in settings to Iris called Sleep, Health, Reading Programming, Biohacking, Overlay, other things and you can really take out literally all the blue if you want which makes the screen look very strange

But at night I turn my screen to sleep which is a much much redder and orange version than what you can get with F.lux and during the day I have it set to health where I can see way more color.

So to me it's like literally a press of one button to change between these modes or to pause Iris and then I can also go into the settings and tell Iris what wavelengths and color temperature of light I want at what time during the day. So I think it has more features and program ability than F.lux is more for people that want to just I don't want something I want to set it. I never want to think about it again it happens automatically in the background Iris takes a little bit more playing around with.

You can certainly set it and forget it but I tend to make changes throughout the day when the sun sets I'm on one mode and when the sun is up I'm on a different mode for Iris and I manually change those.

So F.lux is free just to let people know. Iris you know you can do a lot more by the sounds of it you can really go in and tweak it but you pay for a subscription isn't it. And we're not you know we know we don't have any commercial ties to these.

47:15 Thaddeus Owen Correct. And in F.lux is free. You can't get F.lux on certain devices like Android phones but you can get things like Twilight which are free for Android. And actually Iris for your phone is free where for an iPhone or a Mac you have to pay a subscription fee for Iris and so there may be free apps or built in apps on on your idevices that you can use.

47:39 Jeff Mann Just want to circle back a bit to talk about these glasses. Blue light blockers There's so many have come out in the last few years you say you've been wearing them for four years now as you've probably seen a lot of different brands get you know get on board with this because it is sort of hot right now aren't they.

48:00 Thaddeus Owen Absolutely. And I probably have 30 pairs. I bought quite a few to try out but people send them to me all the time to try them and provide a recommendation. And so I have many many pairs. I've seen almost everything out there.

48:12 Jeff Mann That's great because I I've got some questions to ask you. OK so if somebody wanted to buy a pair obviously you've got a price a factor you've got aesthetics. What's your what's your type of look I assuming you go out with him. I just stay indoors when I'm wearing mine so I don't care if I look a bit crazy.

We've have ones with different types of lenses you know tinted lenses some that are very red, orangey you or pinky lenses some of them some of them have got clear lenses in there. What's your what's your overall advice taking all of those factors into account.

48:46 Thaddeus Owen Yes I definitely have a piece of advice on Blub blockers after dark. During the day of course if you choose to wear them you want the clear ones and we can talk about why.

But at night based on all the research that I've seen and everything that I've studied you absolutely want to block all blue light. And so at the bare minimum you want to have a pair of blue blockers that block as much blue light as possible. Those have the orange amber type lenses in them and they'll block nearly all the blue light.

It helps to look at a graph or a chart from the lens manufacturer that tells you exactly how much it blocks. So every lens manufacturer will send you a chart that says it blocks this much blue light.

And what you find is some of them only block 30 percent or 40 percent or 50 percent of the blue light they let in 50 percent and that's too much. So my opinion block all the blue light and then some people not everybody are also affected by green light.

And so they may want to think about blocking blue and green light after dark and you can certainly get an entire range of prices.

So my personal opinion is I've tried to block all blue and then some of the green and I find for sleep for me feeling sleepy and getting the benefits of sleep blocking all blue and some of the green is the most effective

Those tend to be a little bit pricier glasses. So you can purchase off Amazon or other places six and seven dollar glasses from Uvex and Dewalt.

And they make some great glasses. They are very effective. They're very inexpensive and they they work. They don't look the greatest. If you're going to go out with them.

50:33 Jeff Mann Yeah they're the kind of safety glasses they're built for the workplace rather than going and impressing the girls or the guys.

50:42 Thaddeus Owen Exactly. And I certainly have those and I do wear them at home many times because they they they wrap around the face. They block a lot of light. But you're not going to wear those out at least most people won't want to.

They're not going to they're not going to really be attracting anyone by wearing those. And so so I do have some some brands that I tend to recommend. But in general if I'm not recommending a brand what you want is the most red lens you can get because the redder lenses block all the blue and they block some of the green and basically you can you can have them made at an optometrist if you want.

[00:51:20.31] It's called five fifty 550 BPI tint. That's the tints that are added to those red glasses that block all blue and some green. And you can have your prescription glasses dipped at an optometrist in

that 550 BPI tent but that's my recommendation is those glasses tend to cost between seventy five dollars U.S. and one hundred and twenty dollars U.S. they're the more expensive glasses they look really good. I do wear them out. I've never had anyone kind of look at me funny except ask to try them on.

51:54 Jeff Mann So OK so if anyone wants to try this you can go in a very low cost threshold. You can get a pair of Uvex or Dewalt for six or seven bucks but also you say if you want to be sure that these glasses are tuned specifically to look at those wavelengths, you either go to your optician your optometrist or there are brands out there. Can you reel off a few of those brands that people can just check [00:52:21.69] them.

52:21 Thaddeus Owen Yeah there's there's quite a few now but the ones that I've tested and I've actually seen that their glasses work and block the right wavelengths would be Ra Optics it's our a and then optics like the sun god Ra So Ra optics Rhythm Optics, EMR Tech which is electromagnetic revolution tech and there are the 550 BPI tent from your optometrist.

I did go in and pick out a I don't wear prescription glasses but I went to the optometrist and I picked out a pair of frames and put in what they called blanks. So just polycarbonate lenses that had no coating or no prescription and I had them dipped in 550 BPI tint. So I have done that

53:07 Jeff Mann And it does compared to one of these other brands you talking about.

53:13 Thaddeus Owen Yeah. So there's a a brand called BluBox out of Australia and a brand in the U.S. called Raw Optics and they they dip their lenses in 550 BPI tint. So they just buy what the optometrist buy. And so those brands I know are doing a really good job. And I I looked at what the optometrist did and it was the same. They are very good. What you get at the optometrist if they dipped and 550 and what you get from Raw optics and Blublocks are that 550 BPI tents.

It's very effective it's very red. I would not recommend driving at night with them because you can't see certain lights. So the green traffic light in the US would be invisible with these glasses on. It's not something you should wear while driving.

53:59 Jeff Mann That's a really really important point because there are safety issues because as well as blocking the blue light they will decrease the overall brightness as well obviously because they're filtering light so you don't wanna be going and doing anything is critical driving when you're wearing these.

So how do you check. Let's say one of these brands that don't give specific wavelengths on the on their specs is is there any way to, if you saw a pair that cost 20 bucks. So I like the look of those... how would you go about just checking.

54:34 Thaddeus Owen Well OK there's two there's three ways you can check. One way as you can for seven dollars off Amazon or anywhere you can buy a spectrometer. It's it's a handheld it's not digital.

You can actually hold the glasses against the spectrometer and and then hold it up to a light. And if you see blue like a color blue coming through that spectrometer when you hold the glasses over it up to the light then they're not blocking all the blue light. I've done that many times. It's really inexpensive and you can do it anywhere you can fit the thing in your pocket.

Most people are not going to do that. And so you either must ask the person somebody from the brand in customer service for a lens report [00:55:15.30].

The lens report will tell you every wave length of light and you can look for where the blue light is and whether it blocks 100 percent of the blue light or 10 percent of the blue light. So that lens report is something you can ask for and I've asked for it and always received one. I've not run into a situation

where they didn't send me one. But they don't publish those they don't just put them online. They keep them. But you have to ask for them.

And then the other way would of course be to ask someone else who has either used those glasses or ask customer service what whether they block all blue light and whether it's 100 percent of the blue light.

Now that said if you strictly buy a pair of blue blockers to try them out after never wearing them most people will probably see a benefit from the blue blockers no matter what they're blocking because they're blocking more light than they had been before. But if you really want a pair that's going to last you for a long time and that's the highest quality and blocking the right type of light you've got to ask a few more questions to understand whether they're doing that or not.

56:17 Jeff Mann OK. Well that's great. The really useful practical information Thaddues I appreciate that. One more thing. Light in the bedroom at night. I mean this is pretty obvious one thing that people know about.

But again there's quite a bit of research even small tiny bits of light coming off a light, your alarm clock, little status LEDs on gadgets in the bedroom even small light signals in the bedroom are going to have an effect. So at nighttime we want to try and get blackout as much as possible.

56:53 Thaddeus Owen Yeah that's that's the interesting thing is I've seen the most recent study says 15 seconds of light exposure after dark can stop melatonin production for up to four hours and then these little point sources.

So on your phone charging cables or your your laptop when it's charging these lights flash these little LEDs or a smoke alarm the green LEDs they may be causing an issue with light at night even though they're these small point LED sources and we want to cover those up as much as possible, be as dark as possible.

So I will say like grab some black electrical tape. I carry it with me when I travel for the hotel and I just tape over those sources of LEDs with a little bit of black tape.

They do make some little through the Biohacked company. They make some some circles of red adhesive that you can put over the light so the light will still shine but it will shine red and otherwise everything so that the best thing is to be blackout at night. The second best would be to use candle light at night for any of your lighting.

The next best would be to use some sort of true wavelength red light for lighting after night. And that's what I use I use specific wavelengths of red light that are healing wavelengths at night and they're pure red through LED light I use those at night for my lighting so I can read a book. I can do other things but I'm not messing with my hormones or melatonin.

Then if you can't do that you would use something like a Himalayan salt rock lamp that has incandescent light in it but is filtered through the kind of pinkish red salt.

So you get more red wavelength than you can go to an incandescent light which has very very very little blue. But still enough that it can affect your circadian rhythm. And then of course like a halogen light has even more blue. And then an LED and CFL lights are way too much blue and they're going to shut down your melatonin production at night. So that's kind of my spectrum of good better best lighting.

58:55 Jeff Mann So the bedroom is pretty easy. Total blackout. You want it to be like a cave in in the house. I wondered if you have any opinions on things like smart lights and the Smart home and I know these issues.

I know you talked a lot about EMFs and you know radio frequencies from Wi-Fi and all that kind of stuff so I don't know if you're a big fan of this smart technology but you can get lights now, the Philips Hue stuff. The lights will morph and change a bit F.lux does computes a computer to do in the house. What are your thoughts on that?

59:31 Thaddeus Owen I think this is a super exciting field and I think yes I personally have some issues with the dirty electricity the flicker of an LED and the EMF that can come from it.

However lights that change wavelength and color temperature throughout the day are 100 percent where our lighting companies really need to be going.

So the sun color temperature changes throughout the day and our body responds to that our indoor lighting absolutely can do the same thing. And Philips is the first one of the first companies to foray into that space of circadian lighting.

And I think circadian lighting is a huge huge open market right now that is going to get a lot of attention. And there are gonna be companies doing some really great things to help us on this indoor environment. So I'm a big fan of all of those things. I hope that they are low flicker low EMF low dirty electricity. But there's a big future in those those types of lights.

01:00:28 Jeff Mann Yeah yeah me too. You know see lines of exciting new products coming from from research projects ain circadian lighting but even in the outside world in the street lights know lights on the public transport.

01:00:42 Thaddeus Owen It's crazy. Well the US has our American Medical Association and there they tend to be very conservative. But two years ago they wrote a public letter that warned the U.S. against using LED street lights and LED public lights because of the harm to human health.

And so what you're saying is you know police officers potentially and others if they want it to be daytime during the night they can see but the downside is light pollution we can't see the stars. Animals also have circadian rhythms and circadian biology and the ones that function at night now get messed up with those bright LED lights and then human biology gets messed up by the right the wrong wavelength and the wrong intensity of light at night for sure in public spaces.

01:01:28 Jeff Mann Yeah. Yeah. Well hopefully we'll sort this out. You know if the world doesn't end before then but we're certainly lighting at night time is a big issue. Thaddeus it's been really really really interesting. Got some great tips from this. Is there anything you want to tag onto this conversation that I've skipped.

01:01:48 Thaddeus Owen You know I think the main point that I try to tell everyone is it doesn't have to be really complicated. You can make this really easy and free. I think the two things that you really want to focus on is getting outdoors during the day as often as possible. Obviously practice safe sun exposure but get outdoors. It's totally free. Everybody can do it. And to block and reduce the amount of blue light at night.

Those two things have made a giant difference for me and based on everything I've studied have the potential to make the most difference for the most people. And it's very simple for many people to do.

01:02:25 Jeff Mann I love it. I love it. I'll leave it at that. Your web site primalhacker.com

01:02:32 Thaddeus Owen
primalhacker.com Instagram @primalhacker. I'm very active on Instagram and do a lot of teaching around EMF and light on Instagram and my website of course has lots of all everything on my website is free it's all just education and blog articles on what I've learned through my biohacking journey

01:02:49 Jeff Mann Yeah some really good information on there and you do it you know. You don't just do sleep and lie. You know you talk about diets and fitness and conditioning and all that kind of stuff as well so there's lots and lots of other good stuff on there.

01:03:00 Thaddeus Owen Absolutely yep. I'm I'm an athlete and I study nutrition health and and also fitness and how the body body aesthetics can can be changed with minimal effort. So all that is there.

01:03:12 Jeff Mann Thanks so much Thaddeus, really really appreciate your time this morning.

01:03:15 Thaddeus Owen Thanks Jeff. It's great time.