



# The Method and Meaning of True Science

w/ Greg Glassman

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## Transcript

[Greg Glassman]

Good afternoon!

How is everyone?

Good?

So, it's Thursday afternoon, and you've come out here to listen to a guy talk about broken science. Is that for real? Why would anyone do that? One of my kids offered up free tacos, and I say, "I wonder if that's it. I wonder if that's the deal. It's the free tacos and the mariachis." That's why Jimmy got on an airplane for some free tacos and mariachis. I didn't think there could be a whole lot of that because, I mean, you could also just go give blood and get \$20 or something, right? And get tacos. It'd be easier than listening to someone talk about broken science. But that, giving blood, getting \$25, that's kind of close 'cause I've had you here for a reason.

So, I'm curious as to why you're here, and if a few of you will share that with me, I'll tell you why I had you here. That sounds fair? Because the reality of why we are here has got to be some combination of what I wanted and what you're expecting or thought would be interesting, or free tacos, even plus beer.

So, anyone? James

[James]

Yeah, first of all, recognizing that science is broken and seeing it myself, and also hopeful that this is the start of a movement to be recognized more and to do something about it.

[Greg]

I love that. You're going to make this easy for me. I kept thinking that someone would cue me, and then I was hoping it would happen, and waiting for it... it never really has. But I was hoping that someone would say, "What do you mean by science? What do you mean by broken?" You know, and I don't get those kinds of questions, so you kind of have to force-feed it some. But yeah, it's broken. There's a problem.

But I want to be clear about something. When people ask me, "What's your plan? What's this Broken Science Initiative going to do about broken science?" Like, I don't think this is a fixable problem, but I firmly believe that I can inoculate—can I use that word?—or vaccinate people from the fraud that has gathered around broken science. And which would probably get me into... I tell you, we can do this anyway. You can ask questions, or I can just ramble on like a lunatic.

But there's a corruption part here that's very, very important to realize, and we typically think of corruption in the Tony Soprano sense, you know, doing something nefarious, illegal, for personal or financial gain. That kind of corruption. And I don't want you to lose sight of that definition because that's certainly a factor here. There's certainly corruption, 'definition one'. But there's a 'corruption definition two', and that's when the structure of something is altered so that it impedes its function. And we see that, it's a common phenomenon in computer code—one or a zero falls out, and the thing doesn't do what you thought it would do anymore, right? And that's a corrupted file.

And the truth of the broken science is that it's both corruptions. But the one that happened first was the epistemic debasement; that is, the mechanics of how science work was altered at the university, turned into something that doesn't work, that is broken, that won't replicate. And that is the perfect environment for the 'corruption one', which is the illegal, you know, painting mice and that kind of stuff, right? To publish studies.

There are entire fields of medical research that are plagued by this corruption, and Emily might talk about that later. But I think you all know about it. Some... "I haven't heard"... we'll go there. Anyone else, why are you here?

[Ed]

I think many years ago, I remember seeing Greg Glassman walk into a very small Jiu Jitsu studio. He was soaked to the bone because he was riding a bike in the rain. He wasn't riding the bike he wanted to ride; he didn't have a car because he had just been kicked out of the Globo Gym. And he had this idea and insight into the fitness world and what fitness was. He was the first person to ever give me a definition of fitness that actually made sense, and this was pursuable. And we saw what came of that, right? And I'm on the ground floor on what's next for Greg Glassman.

[Greg]

Thank you. There's a relation... CrossFitters here? Yeah, um, constantly varied, high-intensity functional movement delivering work capacity across broad time and moral domains was the result of my observations turned into measurements, honed into a theory. That is the theory—the constantly varied, high-intensity functional movement will increase work capacity across broad time and moral domains. We ended up calling that stimulus CrossFit, and the adaptation, fitness.

Definitions don't come flavored right or wrong; they're consistent or not, and they're useful or not. That one was very useful. But that process that I just kind of glazed over there, we're going to come back to it—of turning the observations into measurements, and measurements into a theory, and then finding validations through their predictive strength. We're going to return to that.

But that was the gift that my father gave me, and I thought I was hiding from all responsible things when I settled in the space of PE and Gold's Gym and CrossFit Gyms, and I was determined to not be influenced unduly by that. And ironically, interestingly, I was. And the very simple message that I'm going to share with you today about science created for me in the PE space, multigenerational wealth. How's that for interesting or useful?

What I'm calling for is, we need to teach kids about science early, and we need to teach them what science is long before we engage in trying to teach science trivia. And that would be things like explaining photosynthesis in the plant kingdom and making coat hanger and Styrofoam ball solar systems, and all that kind of stuff that you might do during a journey of the Periodic Chart and that kind of thing. It's all kind of standard fare middle school science.

But long before that, we need to teach our kids what it is, what science is. And one of our favorite philosophers, in fact—I'm a product of my upbringing and my reading and training—but what we've done, what Emily has allowed me to do, what Emily has done for me is, just about anyone I'm inspired by, she can either get them in front of me or the last remaining survivors. In fact, the most profound thing written in the past 100 years in the philosophy of science is written by David Stove, and we own the rights to the book; we bought it for \$4,000 from his daughter—\$3,000, sorry, well it's four now!

I can't even believe that either; it's like owning the Magna Carta or something.

The book in particular, it's "Popper and After," it's had other titles. They keep trying to publish it because brilliant people realize its brilliance, and I came to it through other brilliant men that recommended the book. But, uh, we got it on the cheap, and the profundity of the influence is hard to overstate. But what it does is it gives compelling reason to disregard or reject the edifice of university philosophy of science, and that is the tradition that was started by Popper and then Kuhn, and Lakatos, and Feyerabend, those are names you'll see over and over again. And David Stove pointed out what was wrong with them long before anyone else was able to, at least effectively.

Stove says that a philosophy of science, that after 400 years of steady innovation in the sciences, that by, say, 1820, everyone had seen enough of the successes of science that he said just about any drongo—the word, apologize for the Australianism—could understand or could deliver a reasonable philosophy of science. And I had to look up what a drongo was, and it's fundamentally an idiot, was the translation, named after a bird. And I took great comfort in that because I think I learned as a drongo what science was and wasn't, and I think that's why CrossFit came to be.

So, my belief is that we should be able to teach a captive group of eighth graders—they might qualify as drongos—I think we can teach them what science is, and maybe the most important thing about that is that it gives us an opportunity to teach them what science isn't. Science is an interesting field in that it's one of the few that is imperative that it knows what it doesn't know and stays away from those spaces.

Let's look at... So, we could, with the game we'd play here, and I've seen others play it—I grew up watching it played in academic settings. And I never was comfortable with it, but my dad would stand there and ask prominent scientists, very prominent scientists, what science was, and he'd put up everything on the board. And when he was done, he's like, "That's not it. I'll be an astrologer now and tell you how you do everything you got on the board." And the part they missed, it was revealing, impactful. And I'm going to kind of jump around a lot of that. Does someone here want to offer up anything about science before we start?

Now, this is the drongo part. This is easy. You're going to, this is super cool. Let's look at the five criteria.

Modern science—and I'm talking about the science, not the broken science—we're going to use that phrase "modern science." I don't mean "current"; I mean the science that came from Bacon, Newton, our friend Laplace, and Einstein, for sure. But modern science is the source and repository of man's objective knowledge. "Source" and "repository" meaning that's where it comes from, and that's where it sits. It silos in models graded and ranked by their predictive strength: conjecture, hypothesis, theory, and law. Isn't that simple? The models are a forecast of a measurement. It's a forecast of a measurement. It says, under certain conditions, this is something that I would expect to measure, okay? And the predictive strength is the sole determinant of validation. That's it. There's nothing else. Validation comes from predictive strength, period.

Matt Briggs asked me, "So, what about a 70% result?" It's 70%, you got a number, go call it zero to one.

Validation and method are entirely independent. That is a critical point, and this is why I find some, for those of you who are philosophy of science buffs, this is what I think is interesting about Feyerabend, though he was largely out of his mind. He was against the scientific method, and the truth is that method is irrelevant to validation. The line is that whether the model comes from perspiration or inspiration, its validation is found entirely, solely through its predictive strength.

So, if you read " $E=mc^2$ " in the pee bubbles, the strength of it doesn't come from the pee bubbles; it comes from its predictive strength. Any questions about any of that? We're going to dig in just another layer deeper here, and in fact, go from less abstract to more concrete.

Let's now look at what was the sec... there were three slides. I want to look at the method... no, no, let's go to the models, the graded models. That was it: conjecture, hypothesis, theory, and law. Let's look at that.

A conjecture is an incomplete model or analogy to another domain. You might have just pulled it out of your ass, just something you said. Let's see. It becomes a hypothesis when it's based on all the data in its specified domain with no counterexamples, and it incorporates a novel prediction yet to be validated by facts. That's a hypothesis. We do an experiment that demonstrates the predictive strength of that model, and now I have a theory. And that one trivial, one non-trivial datum is a test or experiment you did that demonstrated, indeed, that was a forecast of a measurement. You said what you were going to do, what you expected to happen, and it did happen.

A law is a theory that just received validation in all possible ramifications to known levels of accuracy. Some engineering in there, it's not an easy thing, but you don't come across them often, so it's no big deal, and you have to be a heck of a scientist to come up with a law. And by the way, "Say's law" in exercise science, when the first observation science will give you that, it's no fucking law. Should start with that.

Now, I'm going to take you right into the heart of this thing, on the first order of business here, and walk you through how science works, and then have a few comments about it. So let's look at these words in common use. I said that I came up with CrossFit by taking observations, making measurements, and then producing models that had predictive strength and measuring the results, looking for validation.

An observation, it's a registration of the real world on our senses or sensing equipment. A registration of the real world on our sensors or sensing equipment. I would like to point out that answers to a survey question are not an example of a registration of the real world on sensing equipment, and from that, what we are not able to do is make measurements, and we don't have models, and it's not science. You can talk about a 'survey science', but survey epidemiology is not modern science, and its failures would be demanded by the method. It would be a coincidence when it works.

A prediction is so... an observation. A measurement now is an observation tied to a standard scale with a well-characterized error. You can also feel free at this point to refer to that as a fact in the science world. A fact mapped to a future unrealized fact. A forecast of a measurement constitutes a model. Forecast of a measurement. Map a fact to a future unrealized fact. You hear the notion of an experiment in there.

Validation derived from the predicted strength of a model, graded and ranked as conjecture, hypothesis, theory, and law. We just looked at that.

This material was first published by CrossFit, written by my father, what, 15 years ago now? And it was interesting, the responses to it were from non-crossfitters. One was a guy who's teaching physics for 25 years. "I've never seen anything like this; may I use it?" It works.

Now, we've had reason; there's been talk of trust in science. I want to tell you that any rational trust in science is tied to its predictive strength as the validating criteria for a models. And in fact, all trust, all rational trust, is based on predictive strength. That's the way your bank works, the insurance company works, it's the way we assess our spouses, and our children, even the people you don't trust, when in fact you distrust them, it's because of the predictive strength.

So there's nothing really unusual here. Now, what's happened in academic science is that the inference scheme that supports university science—P values, null hypothesis significance testing, and the like—looks at the probability of data on the assumption of a hypothesis and from there expects us to accept or reject a hypothesis. And in plain language, you cannot. Doesn't work that way. There's a handful of things wrong with this; some of them technical, some of them easy, some of them can be taught to little kids. We were just talking a little bit here ago at the board there about the power of teaching what a conditional probability is, what it means for the probability of A given B means, and how that's not the same thing as the probability of B given A. And that even with your sensitivity and selectivity of your tests, we still don't know what the probability of having the illness is given the test.

This world of academic science, it's the replication crisis. It's not an accident. The system was designed poorly; it's been broken from the start. Now, we don't see this in industry unless it has university or government ties. The regulatory capture, say of the FDA, is 100%. And so we don't expect the normal pressures of industry to manifest in all industry, like pharma. But you go over to SpaceX, for instance, and what you see there is that the contingencies of physics and product and liftoff force models with predictive strength. If there are variances in how the fuel burns or lift occurs, it's pretty obvious for everyone how long do you think you could fool Elon's engineers about your custom rocket fuel? That would be mighty hard to pull off. Mighty hard to pull off.

Questions? Thoughts?

Observation: Registration of the real world on our senses or sensing equipment tied to a standard scale with a well-characterized error. It's a measurement. You can call it a fact.

Tie any fact to an unrealized future fact; you got a prediction.

Conjecture, hypothesis, theory, law. What's the return? One non-trivial datum, and we got a theory. You're in business. You're doing science.

Sir.

[Richard Johnson]

I have a little story that fits right in with your brilliant presentation here. So, you know, it's absolutely true in science that predictive value is really one of the key things. I'm going to tell you this story. You probably don't know it—maybe I haven't followed the Broken Science story very well—but it's totally right, and I'm a scientist, by the way, and I've been doing research for like 4 years.

But I'll tell you this story: In 1924, there was a guy named Thomas Painter, who was the first one to look through a microscope with a special stain where he could count the chromosomes. He came up, do you know this story? So, he counted, in his paper, that there were 48 chromosomes in a human cell. And he said, "You know, it's a little hard for me to tell; it might be 46, but I think it's 48." And everyone listened to him, and suddenly there was an answer: humans had 48 chromosomes.

Subsequently, that was 1924. So between 1924 and 1953, 14 different laboratories validated this. They said, "We see 48 chromosomes." And you know, there aren't 48 chromosomes; there's 46. So, there was this bias that because the person reported there were 48, there had to be 48. In 1952, there was this big book, a pathology textbook, where they said, "It is an absolute: humans have 48 chromosomes." It's like the law, the validation; it's been done.

But there was a guy, there were these guys who were studying this, going, "You know, we only count 46," and there were several groups that were counting 46. They were afraid to publish, and finally, one guy and his friend published it. The interesting thing was, he was a Chinese scientist who had been in a Japanese prison of war camp, and he wasn't afraid to challenge anything. So, they said, "This is wrong. The 14 groups are wrong; it's actually 46 chromosomes." And then pretty soon, the validation came out.

But it's very similar. It's this, you know, observation, measurement, then the scientists get faked into thinking that it's gospel, it's 48, and then everyone says it, and probably they were only counting 46, and they would go, "Oh, I must have missed it."

Broken science. Thank you.

[Greg]

Think of how much more interesting the astronomer and his explanations and calculations became when the eclipse showed up 315 days, 12 hours, and 7 minutes from now. "Right, show me that again. I want to see what else is going to happen."

Thank you for that; that's Rick Johnson. We've met once before, with another physician that I'm very fond of, Mitch Rosner from the University of Virginia. I did my first medical grand rounds at the University of Virginia at Rich's request, but it was a mutual friend of ours that introduced me to Rick. How long's that been? Is that 12 years, 13 years? Yeah. And if I were giving out Nobel prizes in medicine, you would have gotten one for the work in uric acid and fructose. It's brilliant, absolutely brilliant. He first figured out how it is that fructose starts this cascade that reduces unregulated amounts of AMP. It's the fat switch there, fair enough?

Yeah, it's an honor to have you here. The last one of these we did in Phoenix, a 95-year-old guy showed up, David Hastenes, who's the inventor of vector space geometry, showed up to the Broken Science event, and that was really cute to have someone with such an extensive biography in physics drop in on us.

Anyone else? Anything? You may have picked up about science here and not realized it: that observations turned into measurements.

Do you see what's wrong? Suppose we do a study where we survey a bunch of people on what they're eating, and then we follow them down the road, and then we look at the ones that got, pick your horrible disease, and then we look at their survey questions. The temptation is to come to the conclusion that you found a correlation between this behavior pattern, say whatever it was you answered the survey to, and whatever the dread condition is.

The problem in treating this as if the numbers and the work, and all we do in science, is that you're not working with an observation in a survey. It's not a registration of the real world, and neither is one of the things that I can forget the errors in the question. It shouldn't be that the science changes for anything when your mind changes.

Now, I don't think I care. "I really eat a lot of meat, actually. I used to think so, but now I don't"; it gives you a different outcome.

When we create data through something that doesn't look like an observation of the real world, and it could be done in a microscope, it could do with things you built, when we manufacture things and we're stress-testing them, we're looking at an observation of the real world. When we ask you questions and you give answers, we're into a different space.

And there's a very prominent scientist at Intel who has spoken brilliantly on P-values; I think his name is Balkon, who's a psychologist by training. He says that it's not possible to do science in psychology. It's the study of human behavior, and the very things that make science so trustworthy—the predictive strength—is not found in the fruits of what comes out of psychology departments.

We play this game. I stop reading when, and my favorite was, parenting experts at Harvard. Stop. I'm just done. I just love that. I don't want to hear from parenting experts, especially the ones at Harvard. I reject the concept just on the face of it. There are people; there are all kinds of people who have wonderful—I mean, there are brilliant parents, and there's brilliant stuff written on parenting, but "parenting expert," it's a bit much.

Question.

[Thomas Crubaugh]

Greg, I have a question about the definition you have up there for measurement. I'm struggling with what you mean by a standard scale with a well-characterized error.

[Greg]

Yeah, um, 12 inches, we're working in the English standard system, right? Plus or minus a quarter inch, yeah, and that's a requirement. That's a requirement for measurement. Theory of a measurement, I need a standard scale and a well-characterized error, and until we can check those things off, it's not a measurement yet.

Bruce.

[Bruce Edwards]

So, it's interesting. I was thinking about your comment on psychology. I wonder if you could apply that same rigor to sociology, to groups of people.

[Greg]

What's interesting is that some of the work done in physics, specifically the behavior of gases, was actually inspired by some work in sociology. So, you know, you can look at things logically and intelligently and employ all kinds of scientific methodology, or try, but that's not enough; it's not enough.

Has there been brilliance in psychology? Of course, there has. In fact, who is it that I like on King Lear? Douglas Murray. Douglas Murray on King Lear—he thinks that there's more psychology in King Lear than anything that's ever come out of academia, and boy, give him a chance and he'll make the point too.

Not everything is amenable to science. We were supporting Infant Swim Resource, and they teach six-month-olds how to float. They float and scream and cry, and all our kids did it—they all hate it. It's hard to watch; it's like waterboarding children, right? You know, I remember the first time I saw it, one kicked off a shoe, I was ready to go in. It's just like the craziest reflex to watch your kid, this far from the surface of the water, looking up at you, and you're just standing there like, "I'm not doing shit." It's really hard to do, but, you know, 10 minutes

a day, six weeks later, they take a kid on a hot summer day with a hoodie on and tennis shoes and a diaper and the whole thing, and throw them in a pool. Right, they go under, that leg spins, and they come up and open up wide and scream, and that's so much better than the alternative.

So, we were helping in providing every kind of support for the program you could imagine. And I went to the old man; I wanted him to help us. We're going to prove scientifically that this works. And he looked at it, and he looked at it, and one of his first bits of feedback was, "Anyone who doesn't think that a floating baby is better than a sinking baby should have their children taken from them." Just start with that. Then he came back with, "I don't know how this isn't the kind of thing that science does. You want me to prove that floating babies are better than sinking babies? I don't know how to do that."

And the problem is, all these people had paid money, went with their kid, and they're overly concerned about drowning, and the biases are just so many. We can't find a cohort; you'd have to take kids from people unwillingly and have them do something else and compare them. We couldn't figure out a way you could even imagine what the experiment might look like. Maybe over time, with enough ISR, we could reduce the drowning rate in a city or a town, maybe that would be the hope. But it's one of these things again, like my idea of fixing the system—no, the system is not going to fix. We've learned long ago, Rick, everything that's wrong is wrong on purpose. There's someone who thinks it's good the way it is. You don't need to change anything, and we'll fight for that.

Your work on sugarcane workers' disease, kidney disease, is just brilliant, and you better be careful. Yeah, you better be careful. Rick, you went down to look at that and got turned away by CDC security, is that correct?

[Rick Johnson]

Not exactly, but oh, so what we're talking about is, there's a lot, you know. Sugar, of course, is terrible. I mean, sugar is at the heart of what drives obesity and diabetes. To make sugar, one of the things people do is they burn the sugarcane fields, or the owners do, and then that makes the sugarcane easy to cut. Then these sugarcane workers go in there and breathe all this ash and so forth that occurs when they burn the fields.

What's happened is they're working out in the heat, inhaling all these toxins, and they're dying. So here's an industry that's making food that's killing people, and they also have all these sugarcane workers who are cutting the cane for them and are dying from it. There are like 60,000 people who've died so far in Central America, 60,000 in India and Sri Lanka, and they're usually these young, healthy people that are going out there to cut the sugarcane. So it's been a big battle with the sugar industry, trying to improve things and to give them more hydration and shade, and to cut out the burning of the fields. Our group found that the ash carries all these toxins that are actually we can find the toxins in the kidneys of these people when they develop kidney failure, and when we give the toxins to animals, they develop kidney failure.

So these poor people are being forced to do a job where they're actually killing us, and at the same time, killing themselves. So the sugarcane industry doesn't like me. I'm on their hit list in the top five. Sorry.

[Greg]

Thank you for sharing that. These are very young people, in their 20s, with terminal end-stage kidney disease.

[Rick]

Yeah, they're disadvantaged. They're in remote areas, they have very little access to medicine and care. There's no kidney specialist, there's no dialysis, there's no transplantation, and they die in their 20s. And the terrible thing—not just that it's terrible, but then their kids take over. They have to have an income for the family, so a kid



who's like 14 will lie about his age and start working in the fields, and then they die when they're 25. It's just a terrible circle of death.

[Greg]

Anyone else, please?

[Leif Edmundson]

So, you've got things like psychology and sociology which aren't amenable to science, but you say there's still some value to them. Like, what do you do with that? Do you just not call them science? How does the damage get done? Do you classify that as something else, or what's happening now? Is it being called real science and mixing up with good science, or where do you put those fields in the future?

[Greg]

I don't know, but the methods of those—let's be generous and call them 'soft sciences' or the social sciences—the methods that they employ have drifted into the medical space. This is the exact reason that we had in the Begley-Ellis study the abysmal replication numbers on preclinical oncology and hematology. Holy cow, I mean, it was what's the number? 11% of the bedrock studies. Now, there's a bias here; "bedrock" in what sense? These studies were targeted because they had let Amgen down in drug development, and Glenn Begley, they had a hit list. The talk around the watering hole at night among researchers was from this school, trust nothing from this researcher—it doesn't work. They had all this colloquial knowledge of how to tread through this stuff, and someone finally says we need to figure out what is real in oncology and hematology that's real and what isn't. So they all, "I got a paper for you, this one, this one, this one."

But the original alarm went off because Begley had been involved in drug development all over the world, and he had an uncanny capacity to get to successful clinical trials given solid preclinical science. In cancer, it wasn't working. They just, it was, "This drug should work if this study is right." So they went back and looked, and none of them worked, almost none. To make things worse, we don't know to this day which of those studies worked or didn't work, what replicated. The vast majority of it didn't, not one of them has been retracted, and one I know has been cited four or five thousand times since being found to be nonsense.

What got you to that is a science that is concerned... Well, now there's an even deeper issue, and one is—this was something that some of the hard science people that listened to Glenn Begley talk were aghast at—and that was some of the methodology was wildly subjective. "So non-measured, got bigger, got smaller, looks kind of green," you know, that kind of stuff. But the problem comes in null hypothesis significant testing, and generally what happens is you might not even, they may be so bold as to not even offer up a hypothesis. But what we got is some kind of intervention, and we take that data and against a null, we crank some P-values on a test statistic of our choosing, and you can be very clever about that. And if you increase the sample space, your P-value always gets better. I mean, people have learned how to play this game, but in the end, in all of the illusions about this process, and what's funny when you corner the statisticians, they go, "We never suggested that it determined the likelihood that the study would replicate. That's not what it is." Or, "We've never..." We put a list of them up here if you want to go through that slide.

Gerd Gigerenzer and others have put up big lists of common misunderstandings of P-value, and they're almost every single one of them common, hell, universal. They all suggest that you have found something about the probability of the hypothesis given the data on the basis of the probability of the data on the assumed null. Now that may not make sense to a lot of you, but I tell you what, it's a blatant foul. It's really, really bad, and about this, there's been no doubt.

The complaints about P-values started before their implementation. The first person says, Laplace said “you can't do this” but 90 years before the first use of the P-values, there was published material going, “This is mischief. This is mischief.” If you want to introduce yourself to this subject peripherally and with an easy dose, the Wikipedia article on the conditional probability fallacy—it's got another name that makes it easy here—confusion of the inverse, everyone should look at that.

Confusion of the inverse, and it's the problem with thinking that the probability of A given B is going to shed significant light on the probability of B given A. And boy, we see that everywhere.

Anyone else? Yes.

[Rick]

Another trick that scientists use that cheats the public is to report relative versus absolute risk. I think everyone knows this. So, like, if you find that there's a 15% reduction—if you give statin, you can reduce heart attacks by 15%—and that sounds really important if you're, you know, but we know statins are also bad for muscles and all this stuff. But when it gets published in the New England Journal, but then when you actually look at the data, they're talking about relative probability. So if the absolute change goes from 99.6% of the people are fine, 0.4% get a heart attack, and with statin, it's 0.39% get a heart attack, so you have to treat like a thousand people to get a benefit on one person, and then it doesn't sound so impressive. Yet, if you do it the other way, it's a 15% reduction, then you get in the New England Journal, but actually, it's not a very impressive result.

[Greg]

Doc, do you know Malcolm Kendrick? Oh, yeah. You know, it's pointing out things like that that got Malcolm delisted from Wikipedia.

[Emily Kaplan]

Well, Malcolm also just wrote a brilliant piece for us on placebos, which is slightly different but another way to statistically manipulate things where you take a placebo, and you know your drug is likely to have side effects, say like causing headaches, so you decide to put something in the placebo that also causes headaches, so statistically it cancels out headaches as a side effect. Placebos are completely unregulated, so we don't know what's in them, and the common belief is there's nothing in them, and in fact, there's all kinds of stuff in them, and it's kept private and not reported on, and it allows for this sort of statistical manipulation and outcomes.

[Greg]

Anytime someone's feeding you percents of percents, you should check for your wallet; that's some promiscuous behavior. There needs to be a taxonomy of cheats, and part of the problem is, and one of my favorites—I've just fallen down this rabbit hole—but I love the Photoshop cheats on the Western blot stuff. That's just amazing, and the language of science when they found these, they were so careful not to say that this was deplorable, despicable, dishonest behavior. They said it was, “Well, maybe it should be retracted and looked at more closely,” and then you come to find out like, geez, they took an image from an old study and stretched the x-axis, shrunk the y, colored it yellow, and the same artifacts from the photograph from 15 years ago are in this again, and I'm like, “Man, in my head, you're absolutely busted. That's not an accident.” You know, you don't take an old picture and play with the axes and color it, and that happened accidentally. Hardly.

There are consequences for people that call out this stuff, too. People have been successfully sued—not just something Lance Armstrong pulled off—but we know of a guy in Germany that was successfully sued for calling fraud on what was obvious fraud. Be careful.

[Greg]

Do you know Peter Gotzsche?

[Richard]No.

[Greg]

He was a co-founder of the Cochrane Collaboration, and he had the gall to say that mammograms for young ladies who had no symptoms were causing more harm than good. Then he went after the Gates Foundation and the HPV vaccine. And then, what was it... oh, psych meds, claiming none of them work—there's no evidence for any of them. Pediatric antidepressants caused suicide? That all 34 studies on pediatrics and antidepressants—they were only reporting one thing, the mood evaluation, where they had a reduced end in the experimental group. It took a while to find out these kids had hanged themselves, and that was left out of all 34 studies because they weren't reporting that.

But anyways, the next thing you know, he's been accused of some horrible behavior around women in the lab and gets thrown out of the Cochrane Collaboration. None of that ever turned out to be anything, but it was enough to get him out and gone. When he came to San Francisco, we told him, "Dude, you're knocking on all the wrong doors here. This is going to... you won't survive this."

Doc, what's your sense of the COVID reaction?

[Rick]

Well, I mean, there was this thought that the coronavirus might have been manipulated, and that it really wasn't just coming from some wild animal. And you know, there was a lot of pushback on that, but the truth is that the data came out that it really was manipulated. So, that recently was just acknowledged. Yeah, it was genetically manipulated in a laboratory before it came out, for sure.

[Greg]

There was a head of the CEO, president of Caltech, who's a biotech wizard, and he was shown the sequence and said it's man-made, just like that. He saw the furin cleave and like, 'There's no way, there's no way.'

We had another angle revealed; there's a bunch of ways that people will see bullshit's bullshit, but the studies that claim to have sequenced the virus, people were pointing out, and it was a small minority, but some very articulate intelligent people were pointing out that the procedure described in this won't sequence a virus. You have to isolate the particles first before you lyse anything, and what would be in this sputum would be all kinds of bacteria and fungus and other things that this just doesn't work. And this was two years ago, three years ago; we were looking at this, and these were comments from guys, and someone said, "Well, what would it look like if you were to actually show us what the process for sequencing a virus really looks like?"

Seconds later, he's got a big list of them, and he's got the pages outlined where it explains the problems and the difficulties and challenges in using centrifugation and electrophoresis, the cleaning and washing and more centrifugation, and the enormous process you go through to see that you have particles of some kind of homogeneity so that you believe whatever this thing is, we got a bunch of them here, and they all look to be the same. And all that step was left out completely. Now, and yet they claim to have a sequence of it, and one of the things that occurred to us instantly was that no one was saying it, but you could get there on your own, was that they had the sequence because they made the fucking thing. It wasn't because anyone did any actual work on it, and the studies would say, announce, herald the trumpet that, "We've sequenced the thing," and then what they did, that's not how you sequence anything. They had the blueprint.

And I think the public health response, what's fascinating right now for me, for a lot of our Broken Science friends, is that actuarial science is a very real science. And when those guys have a keen sense of what's going on, I think it's more trustworthy and more honest and technically more sound than what's going in public health. Especially when public health has found itself in a position where it would be best to cover our tracks at this point, you know, it's a rough road to hoe. But the numbers that have come out of the insurance company, you know where their data comes from, it's interesting. When you get a job that doesn't suck, you automatically, for most companies, you know, we want to get one of the golden jobs where we work for a big company, you go to work for Intel or Apple or any of them, you automatically get a life insurance policy as part of just being an employee. And there are companies that hold millions of those, so they've got a better window on disability, death, and injury than anyone in public health does. And what they saw was a 40% increase in all-cause mortality among working people in a 30-month period. They said we had four Vietnams in a 30-month period, and they said we can't even tell you if a 10% increase in all-cause mortality is a 200-year event; we don't have the background to tell you what a 40% increase would be. It lies outside of the imagination of the actuarial world. It's fascinating stuff.

Do you follow The Ethical Skeptic?

[Rick]

I don't, but I tell you something. I really appreciate what you're doing because as a scientist, we really need to call this out because there's a lot of fake science, there's a lot of people trying to get their promotion by cheating or by creating control groups, and it's a real problem. And the statistics lie. You know, you're exactly right, the P-value is used to promote something when it doesn't actually say anything. Yeah, you're... I'm so happy I'm here, thank you for inviting me.

[Greg]

I'm going to take another question then kind of end on that. That just made me feel so good because I'm saying the guy should get a Nobel Prize in medicine. He invites himself to my party and compliments us for our work. I'm honored that you feel that way and supporting you and Thomas Seyfried and Malcolm Kendrick and all those other friends of ours that have met Jay Bhattacharya. You know, we've sat with Jay several times, and he's been shaken to his soul. He's been turned on by lifelong friends, you know, is something he just can't believe it, he still can't believe it.

Please.

[Guest]

So, Greg, Emily, and I met through the COVID crisis initially, and that's how we were connected with Jay as well. Actually, Jay and I just had lunch together, and I mean, I think part of what was revealed during COVID times, and I'm a physician, is that just like you said, we don't necessarily have the solution right now; we know it's broken, but we don't have a solution. But as a result of that, what came into being was basically like this horrible response, not just from public health but all across the medical community.

I started CrossFit in 2018, and I was shocked that even CrossFit physicians went along with the crazy response, and you know, didn't really question or speak up about the fact that we shouldn't even have been asking some of the questions that were being asked. You know, people were screaming for trials for things like masking children or not masking children, and nobody was even willing to step back and say, "Should we ask this question in the first place?" about whether children should be masked. So I just wanted to sort of put it out there that if we acknowledge that this system is broken but we don't provide an alternative, it seems like these negative responses will perpetuate and, in fact, Jay was just saying at lunch, like, "I just feel like we're positioned for the exact same thing to happen again." What's changed?

[Greg]

Let me address that, and I understand, I feel everything you're saying, and I'm not going to stand and go "you're wrong," but let me share kind of the CrossFit mindset. I know people that thought that CrossFit was the solution to a global solution to obesity, and the only thing global is that anyone that does it won't have the obesity problem. That's as close as you can get to universal, but I never had for a moment any vision of tens of millions of people doing CrossFit and the community getting healthier through that. But you know, when you're in a position to help, it's like to me, it always felt like you're on the corner, and a bus is coming, an old lady steps out, and you grab her by the back of the jacket and you pull her back with nary a thought as to all old ladies and whether you're making a difference amongst all old ladies and what am I going to do to save the other old ladies, and we're in that situation with fitness and health, and I feel that way about the science.

So maybe with less um... fools like, you know, when Fauci says, "If you don't believe in me, you don't believe in the science," and the way he said it, I think he actually thought that's true. But everyone needed to laugh, that should be hung around him like "It depends on what the definition of 'is' is," you know? I mean, it's just one of those crazy utterances that he got a pass on.

[Rick]

I was just going to say, what you put up earlier, you know, that you begin with an observation, make a measurement to make sure that you actually measure that observation, show that it's predictive, and it's repeatedly shown to be predictive, that validates it, and that is true science. And all these techniques that the statisticians come up with, the multivariate analysis, all these things can lie, but what you just put up does not lie.

[Greg]

Danielle.

[Danielle Edmundson]

I'm gonna kind of tie on to what this nice fellow said, um, in the beginning,

[Greg]

That's Ed.

[Danielle]

Um, 20 years ago, I was starving for a path to... I didn't know that it was going to be my livelihood, but I really wanted to get fit. I really wanted to have muscles and be lean, and there was no definition for it, and it seemed like maybe a lost cause. I was never happy with any of the classes I ever took at any gym anywhere and never got any results. Then you provided a methodology and a protocol that was applicable, and it works. It works over and over and over again. So when you started talking about the sciences being broken, people kind of being duped over and over again, um, it's fine with me that there's not an exact answer for what exactly you do with that. I just... I guess I'm grateful for that. We can... I'm not exactly sure what to say about that,

[Greg]

The difference between the old lady right in front of you stepping off the curb, and the difference between providing the information and treating all the old ladies, and treating all of society, is certainly related to the difference between medicine and public health. And in public health, if you look to the animal world, herd management is public health, and one of the things you're willing to do in herd management is destroy perfectly healthy specimens for the betterment all.

Right?

I think that the admonishment to first do no harm is imploring one to not practice public health on individuals, and boy, did we do that. I mean, we watched the destruction of the public school system. It's in ruins. What can accelerate that ruin is the number of us who figured out how much better a job you're forced to do yourselves, what a better job you can do. Rick, I'm homeschooling my little kids 2 hours a day, 5 days a week; it doubles the K through six pace nationally. I've got a nine-year-old that can do algebra; who would have thought? I was 14 before I fucked up algebra.

We had an event here with a dear friend, Roger Kimble, who's the editor of The New Criterion. I think that he and Victor Davis Hansen are probably the two preeminent men of arts and letters in the US. It's a snob-ass term if there ever was one, but it fits. We ordered a bunch of his books here, and they came after the event. So, I would grab, and he's the editor and publisher, editor-in-chief and publisher, and for 40 years that publication has been publishing some of the most important essays on arts, culture, and history. The book that's out there, there's a bunch of them; there is an anthology of the 40 years of publishing that thing, and it's an honor to call Roger a friend. I wish the hell we could have handed those out when all the Rogerites were here, but the way with books, the publisher doesn't want it back, Roger doesn't want them back. Grab Mr. Kimble's book and take that home with you.

We've got tacos here; we've got mariachis coming. Sevie..

[Sevan Matossian]

Also, Richard brought many of his books. There in the back.

[Greg]

Thank you, Fat Switch, which changed my life. The day I learned of him, I went home and looked up his work, and I have not had a beer since. I told him I went to vodka; it's your fault, but I did get off the beer. I'd rather be drunk than fat.

And MSG, remember MSG used to be something every hippie hated. They used to tell people like they do with aspartame, "There's no evidence, there's no evidence." Oops, yeah, you cats will starve to death fed fruit, but put MSG on it, and they get fat, wow, huh?

You want to make a diabetic cat? Put MSG on something that they can't even digest. True story. Yes, I learned a lot from you, Doc.

Ed.

[Ed]

So, I kind of wanted to go back to the "grab the old lady" concept. You affect one thing at a time, and I'll go back to the CrossFit experience. When I brought it to San Jose PD, I was a police officer at San Jose PD, and it was widely ridiculed, and they wouldn't give us a space, so we would work out in the second-floor parking garage right under the dispatch center. As we started dropping heavy weights from overhead, the dispatchers complained until they finally gave us a space. It was one person at a time, and we ended up with a whole gym there. And I remember your explanation of it at the time; it was really a guerrilla movement. It was from the ground up, it was individuals, and you don't know the kind of ripples that stone you throw in the pond is going to create when they're positive. And one of the huge things that I had to, which is then, was I had the basis, I'd been to the Certs, and I had spent a lot of time in that space, and I could make the arguments, not as well as certainly, but well enough, right? And it feels to me that this is a similar process here, these tools that you're giving me, to be able to make the arguments even though I'm not a researcher and doing amazing stuff or Greg Glassman.

And I think that's what I'm taking away from this. And then to the physician, I forgot your name, what I would say is this: it matters in your practice too because when we look at what the healthcare systems are getting for a certain percentage of vaccinated patients, vaccinated children in—and when I say vaccination, I use the term very loosely—mRNA stuff, it's completely corrupt. My children are grown now, but if I were going into having to take my children to the pediatrician, I would find that really scary because the American Academy of Pediatrics, as far as I'm concerned, is out of their ever-loving mind. So be that doctor, you know what I'm saying? So when you get that patient who's because it's a rough road for people like myself, who, being a cop for 30 years, it's like I get a sense when something just ain't right. I can't put my finger on it; I'm not a scientist, but it's a rough space. So those are the ripples you can provide.

[Doctor]

I'm lucky because I'm in Georgia, but here in California, when you saw what Tracy Hog and others have been through, they can't even say things in the exam room if it's not sanctioned by the State.

[Greg]

Didn't you just have something censored quoting the CDC?

[Emily]

Yeah, and I had a Bobby Kennedy post recently, and I've been shadow-banned since that post, which was talking about our little team meeting him. So it's alive and real. I mean, we've written about how, through COVID, they sort of were doing what I think of as like a pressure test, where anything you put on Meta platforms or other social media, if it wasn't in line with the WHO guidelines, then they would take it down, and that was their sort of barometer of whether it was true or not. The WHO is obviously not a research-proof institution, but now they've actually encouraged, or you know, sort of gone out and tried to figure out who are local health authorities. So like the American Academy of Diabetics, the American Academy of Pediatrics, the American Heart Association, so if you publish anything on, like the keto diet for cancer, like Tom Seyfried's work, you will get taken down because it's against the standard of care, and it's against the guidelines that the American Cancer Institute, so it is a form of censorship that is so prohibitive to critical thinking and frankly to progress.

So one of the things that I've written about for us is the notion of you look at in history where have consensus-based scientific ideas been undone, and it's always from outsiders. It's very rarely from somebody inside the institution or the medical practice. It's advocacy groups, rogue researchers outside who say, "Nope, this drug isn't doing this," or "There are these side effects." We all got together; you actually are not going to be able to do that online anymore because all of those would go against the guidelines of the institutions.

[Rick]

I could add something too, you know, I actually am boarded in infectious disease as well as nephrology, and you know what bothered me about the COVID vaccine—I mean, in the beginning, I mean, my own personal feeling is that when the initial COVID was killing everybody, that the vaccine, even though it wasn't tested adequately, was a kind of emergent attempt, you know, to help. But then they kept pushing to have the vaccine when the mortality rate went way down, and they weren't testing it adequately. So, you know, the safety... you know, back in the 1940s, there was a hepatitis vaccine that was given to 40,000 troops during World War II, and it was tainted with another virus, and it was for yellow fever, and it carried hepatitis B, and it killed a lot of people. And the trouble with the COVID vaccine is it's been associated with bad things like myocarditis, but they don't test it in an adequate way. If you really want to test if the COVID vaccine is safe or does it not cause myocarditis, you would do an echo and all these tests before the vaccine, give the vaccine, one month later test, and see if there's evidence of it. You wouldn't just say how many people go to an ER because myocarditis is often silent. So I have a lot of problems with the way this was handled, and I am a scientist, infectious disease certified, boarded guy, so it is a very debatable thing.

[Greg]

And yeah, um, paint a positive picture on the Pharma companies wanting to withhold the test data from the public for 75 years. Put a good face on that, and like, just would you think it's because it's good because it reflects favorably on them and it would be such good news you wouldn't be able to deal with it? Does that seem likely to anybody? If I have something, and I'm like, "Dude, you can't see this for 75 years," I'm telling you, it's not a pretty thing. That's just straight-up common sense. There were a lot of people that saw a lot of things. Before COVID became news, I had made a hobby of watching flu deaths, and I thought it was fascinating that in October of 2019, the flu tally was, it was a 3X gap in the high-low numbers, I don't want to make up numbers, but the range of deaths in the estimate was huge, and I was like, "How the hell does that happen? How do you have between 15 and 45,000 people dead, you know?" And like, the thing is, there are 45,000 dead people, but there are disagreements about what they died of. So if you're sitting there in your dialysis treatment, you end up in intensive care, and pretty soon you're blowing snot bubbles, and they're concerned about the spread of flu in the ward, and they test you for flu, and you die, you know what you die of?

I mean, it's not, none of this is easy, and there are no right or wrong answers, and so those kinds of estimates, that's just baked into the nature of the problem, and there are issues with reporting. There's some weird phenomenon like, they quit, you know, when flu season ends, flu season doesn't end because there's a drop-off in the flu rate, it's because insurance companies, past a certain point in the year, won't pay for the vaccine, so now the damn thing's gone. If you're not going to pay for the vaccine, there is no flu, that's what marks the end of the flu season, and the CDC announces it, and that's when the vaccine companies are out, they're not going to pay anymore, they're not going to do any more work for that.

And so here we have a new disease with remarkably similar symptoms, in a where the diagnostic test is PCR, and it's made emergency provisional use because they haven't completed the necessary scientific work of finding its sensitivity or selectivity, or even anything like positive predictive value, haven't even gotten to that side of the fence or negative predictive value, and the reason for that is that they don't have a gold standard with which to assess the test, so the whole thing is a crapshoot. And yet, you're telling me this guy died of that thing? Interesting, interesting, and then the numbers got worse and worse, and what happened? Flu deaths disappeared. I mean, the whole thing stunk, just like, "I need 75 years before I can show you the data," and a lot of people saw that. A lot of people saw it.

The idea that you'd have your career ruined by doing something as simple as a seroprevalence test, and the heat that those guys took for that, it was just unbelievable. Yes, you had, you were going to ask another question?

No?

[Guest]

So um, I run the drug and alcohol rehab up here; we have CrossFit in our program. So, in 2019, our demographic of people coming into treatment was 49%, 48% were there for alcohol, 52% combined everything else—prescriptions, weed, coke, whatever. Fast forward four years now, we're at 79% are there for alcohol, 20% everything else combined. But what I'm noticing is the ones that are coming in, the extent of their physical damage, the DTs, we've had to send people to a hospital to be put in comas to get detoxed. Do you think this is just because, you know, it was everybody stay at home, alcohol's okay, or do you think that the COVID or the vaccine or combination of both is making things worse, or is it just the processed sugar that is just wreaking more havoc on the bodies than in the past?

[Greg]



This is, I don't have a scientific answer, but I still want to share what I think here. I remember early in the pandemic, I was talking with Jeff Cane, and he was talking about the bars in the marina, and he had his whole list—the gyms and all these things closed—and he says those are all the damn things that make us a civilization. You can't take those away from people and lock them indoors and think they're going to do anything other than lose their fucking minds.

We need church, we need bars, we need restaurants, we need schools, we need gyms for what ostensibly, for the stated purpose, but for communion, to be around other people. We're as social an animal as an ant. A singular man doesn't survive. I stick you on an island, you know what's going to happen? You're going to die. That's what's going to happen to you.

We need each other; we can't even bring in the collective wealth we have with numbers drastically reduced from where we're at. All countries, these populations aren't growing, are in a hell of a bind. China, they got a huge problem. They said now, Doc, that it's at a point where a forced pregnancy on all the high school girls wouldn't fix the problem now in China. The shrinking population is that bad; they're going to lose half of their population in 30 to 50 years. Half, and that's a horrible thing.

Okay, we're done, sir,

[Guest]

Talking about hiding data. So I brought this up to Emily over Instagram one time, just recently. My dad's from Taiwan, and we did a trip last December to see family, and I was just curious, so I looked online at Taiwan's health of vital statistics, to look at death rates. They have all these years listed, and the very last year that's available is 2019. 2020 all till now, not available. And we heard at the very start of it all that Taiwan's control of the virus, everything was the best, right? Very few deaths. I'd like to see what the true death rate is, right now, at this point. You guys, go look online; look it up. The very last date, 2019, it's crazy, crazy.

[Greg]

I have a very natural nature of, you know, a few things hidden behind the back are good for you, right?

Yeah, I understand anything else?

Thank you, thank you.