Evolution and Training: An Interview with Dr. William Meller

by

Jim Steel

Dr. William Meller is the author of *Evolution Rx: A Practical Guide to Harnessing Our Innate Capacity for Health and Healing*. I found his book in a blurb in *Powerlifting USA* titled "Don't Stretch", and of course that piqued my interest. It is a book that speaks to me because it focuses on the ground floor, the basics. It melds with the Starting Strength philosophy and the philosophy of "The Truth", of "Choosing the Path Less Traveled", of "N.O.V" and so on. This book explodes myths and teaches the reader the ways that we are meant to eat and move, and how and why we are wired to be the way we are today. I tried to ask the good doctor questions that would relate specifically to the Starting Strength readers, but there is so much more to learn from this man – I really just scraped the surface. Some things will be controversial, but it's all interesting.

Jim Steel: How did you become interested in studying evolution as it pertains to modern lifestyle?

Dr. William Meller: I was interested in evolution before I became a physician. When I was an undergraduate my major was Anthropology. What I was really interested in then was cultural behavior. A lot of anthropology focuses on how people act in different societies but I always found that a lot of what they were doing was determined by the environment they were in. Anybody studying any biology at all becomes exposed to evolution. The whole point of evolution is that it's such a great theoretical framework because it explains so much when you start to look at things in terms of 'how did this help us survive' and 'how did this trait or how did this behavior help us survive or not' because sometimes it's counterproductive for survival. But anthropology is a field in which it is difficult to do good field work. You become a theoretician and you sit in a university and write papers. I have this thing where I really want to interact with people; so when I came in contact with medicine it really turned me on. In medical school I used my earlier training in evolution and anthropology to help me understand people and illness, so that's really how I started out being interested in evolution and medicine. Then in 1995, a book came out called *Why We Get Sick* by George Williams and Randolph Nesse. Williams is a theoretical biologist who originated these ideas and Nesse is a psychiatrist. It's a very good book – way more sophisticated than mine – but it is not geared to most readers and doesn't focus on practical advice.

S: In my experience, there are some doctors, when they see patients; they look at it purely in terms of 'what kind of drug do I need to take to make it better?' This, while you're thinking, well maybe there's an evolutionary reason why this is happening, rather than let's give you a drug and get the problem to go away. I remember in the book you were talking about cat allergies, and you say that if you have a cat and then get rid of the cat, the allergies go away – but of course they don't always want to give up Fluffy.

M: I didn't start using evolutionary medicine right away. I did about ten years of practice without trying to incorporate evolution in my practice at all. I was just learning how to be a good doctor, doing diagnosis and using all the drugs I had been taught to use. It wasn't until about ten years after I started practicing that I read the book *Why We Get Sick*. Then I was asked to teach a class in evolutionary medicine at UC Santa Barbara. That's what really turned me on to the possibility that I could use this kind of reasoning in my practice and these kinds of explanations with my patients. When I started to, my patients loved it.

S: Sure they did. I mean, it's just fascinating.

M: It's fascinating and it explains us to ourselves in terms we can understand. There's nothing mysterious about it. It's way more self-evident than a lot of other explanations.

Evolution and Exercise

S: So I'm just sort of relating this more to Starting Strength, the website and the population that are going to read this article. I know when we talked before you said that a heavy deadlift isn't the most natural thing – picking up something heavy from the ground – but you said that squatting was very natural for us.

M: Well, look at the size of the various muscles in our bodies, and what's the biggest muscle? Your quads, your anterior thigh, right? There is a reason for that. It has to do with standing up and jumping, lifting and climbing up rather than bending over from the waist. Before we were upright, two-legged walking primates, we were four-limbed primates and we did a lot of climbing. We probably didn't stand up at first to walk on the ground; we really stood up so we could reach a higher branch and keep climbing and pull ourselves up to the next branch using our biceps and upper-body strength. In climbing trees, there's a lot of squatting and pushing up just using your legs, using your arms for balance and gripping and pulling. By doing that, we developed a more upright posture, so that when we did get down on the ground, we were able to walk and then even run, which turned out to be a huge advantage.

S: What do you think about how we are as Americans, how we barely ever squat down? How is it that by our twenties or thirties, to get into a squat we moan and groan and it becomes an unnatural position for us? I know you worked in Thailand before, and the folks over there are in a squatting position all the time. I've seen pictures of them eating like that and visiting with each other in a deep-squat position.

M: Yeah, exactly, in much of the world, other than the West, squatting is the natural position of rest. It isn't in a chair. I think in our culture we admire being tall, being "higher up" than somebody else, we have an innate respect for people who are taller and that kind of thing. People who are taller are measurably more successful on average. So, being tall became a mark of stature. It actually has two meanings, both height and achievements. So we strive to be "upright" and got out of the habit of squatting. In Asian and African cultures, many people squat their whole lives, many don't even own chairs. This is based on our natural "design". It's very good for our low back and it's very good for our legs. The stronger your legs muscles are, the less likely you are to fall.

S: Starting Strength readers sometimes squat with tremendous amounts of weight on their backs. Was there a reason for having weight on your back and squatting down?

M: Yes, when our ancestors started to hunt larger animals they needed to be able to carry them back to camp. There's some controversy over when this was, but probably close to a million and a half years ago. We have found stone tools much older than that, but we have really sharp tools dating back to a million and a half years. They were using spears and throwing sticks to hunt down large animals. Once they were able to kill larger animals they needed to be able to carry them home, or at least carry home large pieces. That kind of lifting, where you're taking an enormous, literally "dead" weight, and putting it on your shoulders and carrying it, well, that became vital. Strength – male strength – in bringing that thing home after hunting, was a key to survival for the whole clan.

S: What about pressing overhead? One of the lifts is an overhead press, a military press. It doesn't seem like there was that big a use for it back in the Stone Age.

M: Yes, I'm not sure why they needed big delts, I don't know why they would have needed them, except for reaching and carrying things overhead. Certainly now we build them up because of our concept of the ideal form, for what it does to our shape. We do know that a broad, generally triangular upper body, tapering down to a narrow waist is an evolutionarily desirable shape.

Body Composition

S: What did the Stone Age man… what should I call him?

M: We just say the Stone Age man because it's easy and everybody knows what we're talking about. Although now we believe there were any number of species: Homo erectus lived for hundreds of thousands of years and then died out and Neanderthal came and went. They all pretty much used stones as the hallmark of their technological levels.

S: I know you said in your book that the average height was around 5'10".

M: Now we think they were even taller. After the invention of agriculture, after the change from a meat, protein, and fat based diet to an agricultural diet about 10,000 years ago, our human ancestors were much shorter on average. 5'2", 5'5", 5'6". We know that Stone-age men were as tall as we are. It is

our genetic makeup that allows us to grow to the height that we are. Given a certain genetic program, all you have to do is adequately feed children and keep them from getting sick to enable them to grow to their maximum, optimal height. So our height is probably close to that of the early man, because their diet was rich in protein and calories. However, when agriculture intervened and gave us a very carbohydrate-rich diet, it was punctuated by periods of famine when the crops didn't come in. This caused our more recent ancestors to not grow up to their full genetic potential.

S: What about their body composition?

M: They were massively muscled. We know this because we can look at their bones and see where their muscles were attached. Bone reacts to the amount of pulling the muscle does and it gets stronger, wider, and thicker. We can look at that and see that their muscle mass was, in many cases, twice what ours is, maybe comparable to a modern-day lifter. Of course they needed to be able to run too, so their physiques were a combination of strength and cardiopulmonary fitness as well.

Cardiovascular Exercise

S: When they had to run, did they have to intersperse periods of sprinting with long walks? Let's say they hunted something down, would they actually try to tire things out or would they do it in a quick burst?

M: There are several different kinds of hunting. There are places where they had to run long distances, to chase animals down after they were wounded. When we look at their descendants as in Africa, we find people who are extremely good distance runners. They were out in big, open plains; there weren't a lot of places to hide. We had to evolve this kind stamina, so we could run animals to the point where they were exhausted. But in many more places our ancestors used stalking and trapping. They used their brains. They developed the skills to sneak up on something and whack it on the head. They had a lot of time and they knew a lot about the natural behavior of all of their prey. If you've taken a wilderness survival course today, you know that there are all manner of fantastic traps made out of simple sticks and rocks that can bring down pretty much any kind of animal you want. Slowly accumulated knowledge was what got them through. It wasn't how fast they were and it wasn't how strong they were; it was that increasing body of knowledge that our evolving brains allowed us to store and pass down from generation to generation. That's what really allowed us to become the dominant animal that we are.

S: How active was the Stone Age man compared to today's man? I know that to keep that muscularity up, when they were active, it was very intense, right?

M: Probably much more active than we are now on average. They had to get up and move to get anything. Nothing came to them. You know, they had to walk to get a drink, often a mile or two just to get water. They had to climb trees to get fruit, they had to dig in the ground to get roots, they were really very active when they had to be, and they had to be a lot of the time. But there were lots of times where they didn't have to be active at all. If you're living in subsistence way and you have enough of food for that week because there's ripe fruit around or because you killed an animal recently, you can

just sit around the fire and tell stories. It was healthy for them to be lazy. They didn't need to waste energy. We come by our laziness naturally. Athletes today, who go out and make themselves work in order to be fit, are actually rare. They're not the majority of the population. They do it for very clear reasons: they do it to be more attractive, and they do it to feel good because there are definitely chemicals made in our bodies in response to exercise that help us feel good. We do it for a sense of satisfaction or achievement or discipline. But it's still a minority of the population.

S: So, I have this thing: if I don't exercise daily, I feel like I haven't accomplished anything. This is probably an issue I need to have therapy about, but I don't think I deserve my meals. Some people can just seem like they're on constant celebration, whereas I always think that you have to deserve it. Is that some trait that I have that has been passed down to me?

M: I know just what you mean. There are two components to it: there's the psychological part of it, and then there's the physical part of it. Exercise is addicting because one of the things that happens when you exercise is those chemicals released in your brain that make you feel good. We can easily get hooked on feeling good. When you're in the habit of exercising and getting your endorphins that way, if you don't you go through withdrawal and you feel bad. It's not only endorphins, there's another group of chemical messengers called cannabinoids, like the chemicals in marijuana that get you high. We now think that exercise is not actually so much an endorphin high as it is a cannabinoid high. There was some very good research done four or five years ago by a group of Canadians. They used a medicine that blocks endorphins and tested it to see what affect it had on the runners "high." They found that blocking endorphins had no effect on the runners high. Then they used a drug that blocked cannabinoids, and the athletes said that it completely blocked the good feeling they got with running. So there's a very strong belief right now that the high that you get from exercise is really cannabinoids. If you think about this, it makes sense. There are no heroin addicts shooting up and then going out and exercising. They just lay there and fall asleep. Whereas there are lots of athletes who get stoned on pot and then go out and exercise because that kind of high is very similar and allows you to exercise.

S: You said "once that idea takes hold, it'll take hold everywhere." What's that phenomena called again?

M: Memes. Richard Dawkins invented the idea of memes, ideas that can spread amongst people in much the same way as germs.

Diet/Nutrition

S: What about meat and brain size? Did eating meat coincide with us being able to hunt better and to figure out things better and to be smarter? Is that because we started eating more meat? Is that because we became better hunters and our intake of meat started to increase?

M: That's a very difficult question. It's kind of a chicken and egg thing, but we don't know which came first, the diet or the bigger brain. My guess is that it was an evolutionary mutational accident. Meaning, there's nothing about evolution that is going to make people smarter or make any species

of animal smarter. But genetic accidents happen all of the time and this is what natural selection acts on. Accidents, mutations, that enable the organism to survive better get passed on to more progeny and spread through the population. That is evolution in a nutshell. If, by mutation, one earlier man became cleverer, that gave him a huge advantage. So the gene that made them clever spread in the population. Clever in this example meant that they were better at getting more protein and fat in their diet, and thus better at surviving.

S: As hard training athletes, how should our diets mimic the Stone Age diet? You know, what are we supposed to eat to look like those guys you just talked about? We've gone through everything with nutrition. In the eighties it was the high carb, low fat. Of course, people got heavier and lazier. Then Atkins came along. Now in bodybuilding and weightlifting circles, the Paleo Diet is very popular. You know, they allow fruit, but you stay away from the starches and don't worry about fat content as long as it's not a lot of saturated fat, and if you get it incidentally with ground beef, that's fine.

M: The Paleo diet is an attempt to mimic the diet of our ancestors. It isn't so much that it was the diet of our ancestors because most of the foods we eat today weren't around in the Stone Age, except meat. But it is closer to the diet that we're evolved to eat. Our bodies have an enormous number of different hormones and chemicals, like enzymes that digest food, and signals to tell us that we're full. All of which are designed – selected is a better way to put it – for the foods that were available at the time. The vast majority of the calories that were available for the past million to million and a half years came from animal protein and fat.

S: I know that some bodybuilding and weightlifting diets definitely recommend dairy, especially for weight gain. And I know that there are some lactose-intolerant people and the Stone Age man had no access to yogurt or cow's milk and stuff like that.

M: They had access to no milk after about the age of four, and before that it was of course only human milk. Over the course of human history, lactose intolerance has actually been the norm. Most people in the world are lactose intolerant. Africans and Asians had traditionally very little access to milk after infancy, so there is no reason for them to be able to digest lactose. All humans are lactose tolerant in infancy because that's the source of nutrition for the first months and years of our lives. If they were lactose intolerant they would have withered and died.

As we grow up the enzyme that we use to digest lactose, called lactase, decreases in most people, because it wasn't necessary in the Stone Age. But in some populations, like Finnish reindeer herders, it was an enormous advantage for them to maintain the lactase through adulthood. People who could did much better than those who couldn't, and those genes spread through that population extremely rapidly. We can see this in their genes very clearly. It went from a couple of percentage of people who were lactose tolerant to 99% of them in only a few centuries. This scenario has been repeated in all milk-drinking cultures across Europe. It is an example of very strong evolutionary selection for a beneficial trait. The modern epidemic of diagnosing lactose intolerance is mostly a silly fad among both doctors and patients.

S: It's common in body building and weight training circles to eat small meals. So in a typical bodybuilding or weight training diet, they'll eat every three hours, six small meals a day. Does it make sense from a Stone Age perspective? Then there's another school of thought that says no, we weren't meant to do that, we were meant to hunt during the day and eat a big meal at night.

M: The answer is you can do anything you want, anything you feel comfortable with. A calorie is a calorie; it doesn't matter when you eat it. It really doesn't matter. There are some things that you have to watch out for. Like if you have a significant carbohydrate load you may get hypoglycemic if you exercise an hour and a half later. It's natural. You may not get hypoglycemic to the point where it becomes symptomatic and you feel it, but many athletes know they just can't eat carbs then go out for a run; you're going to end up pretty spacey. Also, when you do eat, blood flow increases in your gut; therefore, that blood is not available to your muscles. This happens so that we can digest the food in our stomach and carry the nutrients to the rest of our bodies. This makes you feel weak, and it makes you tire more easily. Eating frequently during exercise doesn't work. Also, don't stuff yourself before practice or you're going to be slow.

S: What about post workout recovery? Are shakes beneficial? Does it matter if it's liquid or an actual meal?

M: Everything we eat becomes a liquid by the time we swallow it. This is what chewing is all about – if it's done right. So there is no difference between meals and shakes unless you are so tired you can't even chew! The idea that people should consume a post-workout shake with 3:1 carb to protein is a total myth. The body doesn't require this after exercising. All our bodies need is an adequate amount of the proper nutrients. There is no magic ratio.

S: What about eating organic?

M: Despite 50 years of research we are still unable to detect any health benefits of eating organically-grown food. Most of it is just marketing, myth, and moneymaking. One reason people begin to eat organic food is to keep from getting sick, but people who eat a holistic diet get sick just as frequently as those who eat non-organic.

S: What role does alcohol have in the diet?

M: Alcohol is a perfectly fine thing to drink, in moderation. Our bodies are very good at handling toxins. For a long time we have known that up to 2 drinks a day is beneficial. People who drink 2 ounces of alcohol a day, that's two glasses of wine or two shots of liquor, live longer than those who don't. Our livers are much larger than they need to be. This is because we were exposed to toxins more often and in larger amounts in the Stone Age than we are now, despite what we are told in the news and in health food ads. One theory as to why alcohol helps is that detoxifying alcohol may trigger our livers to be more active, thereby stimulating our liver to denature other toxins when we are exposed to them.

Longevity

S: When I talk to folks about trying to get back to our Stone Age roots in lifestyle, a common answer is, "yeah, well they only lived to be 30," meaning their life expectancy was short. Is this a myth?

M: Yes, it is a myth. The average life expectancy was 35, but this was because half the population died before the age of 5 and the other half lived to a much older age. There is clear evidence showing that some people lived to be very old in the Stone Age.

S: So those people were able to live longer and pass on their genes?

M: Long life is another issue. We think that one of the keys to human longevity is when older men had children with younger women it was much better for the tribe. This enabled them to pass on all the traits that contributed to their longevity to the next generation.

Stretching

S: I know that stretching, static stretching especially, is something that's not natural for us to do. Can you explain how this has come about or in your research how you discovered it? Or maybe the question should be, what should an athlete do, particularly a weightlifting athlete, do before they lift weights? Should they static stretch or should they warm up? Or should they just go right to it?

M: Static stretching is unnatural. It just doesn't get done in the natural world. There's nobody in the wild, no native people, no aborigine, and no primitive culture where they've spent a lot of time doing anything like static stretching. When they go from a period of rest to movement, they start very slowly. We call that warming up. Physiologically, our bodies only pump blood into 20 to 30 percent of our blood vessels at one time. We don't use all of our muscles and all of our blood vessels at the same time. So our blood is directed mostly to our active muscles or to our internal organs when we are at rest. When we want to be active we need to increase the blood flow to the muscles that we are going to use. We have to selectively open up different parts of our vascular system depending on what it is we're going to be doing.

S: So if you're going to do a squat, you want to warm those squatting muscles up? You could do some free hand squats, some lunges, stuff like that.

M: The key is to simply start slowly. As soon as you start to move a muscle, your body says okay I need to increase the supply of blood to that muscle because there's going to be some demand here. So if you start slowly, the blood vessels dilate slowly, and that increased blood flow actually feels warm. That's why we call it warming up. And when you do that, it makes the muscles more flexible and also increases their ability to contract. If you stretch a cold muscle, you're much more likely to tear it. This has been shown clearly now by research. Athletes who do static stretching before exercise have a higher risk of injury and it reduced power as well.

S: So is there any need for static stretching? You only need to be as flexible as the sport. If it's a sport like hurdles, I could see.

M: Well even in hurdles, if you want to increase your flexibility and range of motion, what you should do is stretch after you're warm, not when you're cold. Because if you stretch when you're cold, it's like…think of a piece of taffy, when it is stretched it breaks when it's cold, and it stretches when it's warm. Our bodies are the same way. If we stretch very gently, generally using nothing more than gravity, through time our ligaments and tendons will get as long as we want them to be. We can be contortionists if we want to; we have that amount of flexibility built in. But contortionists don't get that way by pulling hard against the tendon, that's not going to make it longer, it's going to do damage.

S: And there's no need for it unless you're a contortionist…

M: No, even if you want to be a contortionist, you start when you're very young, when your ligaments and tendons are physiologically less well formed. They don't have all the cross-linking that causes them to be tight; they can lengthen at that point. It's like the old Chinese custom of binding women's feet: they break them when they're small and they bind keep them small. If you want to be very flexible, do it when you're young. You can become more flexible at any age – it just takes a lot more time.

S: Dr. Meller, I just want to let you know how much I appreciate you meeting with me and answering my questions. I think this will be an enjoyable interview for Starting Strength readers.

M: My pleasure.

Jim Steel is the Head Strength and Conditioning Coordinator at the University of Pennsylvania. He has worked as a strength coach at all levels of education, from high school to D1. He is a competitive powerlifter, the current New Jersey state record holder in the squat (820 lbs.). Jim was an All-American defensive lineman in college, and he brings a personal appreciation of the practical applications of strength to his weight room. You can find him online at Bas' Barbell Club.

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