

Starting Strength

The Map of Athletic Performance

by
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Training is a confusing subject. Conflicting points of view have a way of making productive dialogues a rare event. For me as a dedicated rock climber, it's been a slow process to understand this. Being an athlete whose sport is somewhat uncommon – at least when I started 20+ years ago – it meant that there wasn't much for me with regard to effective and established training protocols. So I ended up trying all kinds of things in an effort to continue to improve at my sport. Most of the time, new methods would work for a while, but not for any length of time, and I never had a sense that I could repeat it. The metaphor, “not seeing the forest for the trees” perfectly describes my experience with training and all the many “methods” to choose from. It's hard to move beyond the hype and gather any real benefit, and I believe that many athletes struggle in similar ways. There are many different camps in the world of training, and each camp emphatically states that *they* have the best method, so much so that I felt a lot of confusion instead of understanding. Applying various new approaches to my training would work for a short period of time, but I would invariably go backwards, overtrain, or lose momentum. The constant companion to my desire for improvement as an athlete has been the desire to understand the process of how improvement occurs. Training was always a means to further the original goal of being a better climber, but if I couldn't repeat the positive results, what did I really understand?

Conflict is a necessary ingredient for further growth and refinement, and there will always be differences. This is the way of the world and not something to try to eliminate, argue with, or fight against. When it comes to athletic training, I have developed a basic understanding of how the body responds to physical stress, and that response has everything to do with athletic gains and consistent improvement. It's everything I wish I had known as a passionate novice athlete that wanted nothing more than to excel quickly. Over the past few decades I've accomplished a lot, but all that athletic experience may not be as valuable as my understanding of how important strength training is when it comes to getting consistent athletic gains.

Recently it occurred to me that physical adaptation to athletic training follows a predictable pattern that depends not only on a consistent commitment to continued improvement, but an intelligent approach to that commitment that not all training methods possess. This article is the story of my synthesis of this pattern into a concept I call The Map.

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Eight years ago I was introduced to CrossFit and fell under the illusion that I had found a magic bullet for my training. I was wrong. Throughout my career as a climber, I had experienced some noticeable results from running, and even surfing, but like I said earlier, those results were not repeatable and would eventually begin to take away from my climbing. Entering into a gym environment was an entirely new thing for me; working in a generalized training program such as CrossFit was even more unusual. The initial gains I achieved were exciting, but that improvement only lasted a few months. I spent the next few years both chasing and defending the idea that CrossFit was an effective program for anyone, elite athlete or housewife, even though the same thing I had experienced with previous training methods was happening again. This ultimately became a conflict of interest while being paid to travel the country teaching CrossFit Certifications and owning an affiliate gym. In retrospect, the value of my association with CrossFit derives primarily from my introduction to multi-joint barbell movements and the experts I met that taught them. The full potential of the barbell, however, wasn't realized until these recent post-CrossFit years.

Origins of the Map

Three years ago I sold my share in CrossFit Santa Cruz Central and disengaged from CrossFit altogether. To make it complete, I put a personal call into the founder and CEO of CrossFit, leaving a voicemail that said I was leaving the program. It was interesting that I never heard back from him directly, even though I was one of the original professional athletes who helped lend credibility to the program. This further confirmed that my decision was the right one, as it was obvious that there was little integrity inside that operation to begin with.

Results are miraculously explained in CrossFit with the “black box theory.” No one knows why (the Box, after all, is Black), but their deadlifts keep going up. No one knows why but their “Fran” times keep going down. Even accomplished athletes such as myself (and there will be others) have extolled the virtues of CrossFit while never really understanding what about CrossFit was responsible for those changes. After many hours in the gym and after many certifications, both as participant and paid instructor, it was only after walking away that I really understood some essential elements of training that had been lost on me because of all the hype.

Now fast forward two years. The scene is my home in the Redwoods outside of town. I have a rack, two bars, iron plates, bumper plates, a flat bench, and a small whiteboard in a very small garage. Without any frills, I have the bare minimum of what I need to continue my own training, my family's training, and the few clients who come up to the house who are interested in basic barbell training.

One of my favorite clients who I had not seen since leaving Santa Cruz wanted to get started again. During the several years we had worked together, he had many athletic interests, from surfing and skiing to climbing. A friendship developed out of our mutual interests and our professional relationship. I did not realize how much time had passed until we started talking about his training. I asked him what his goals were, and what he wanted from working with me again.

His reply was, “It's the same as it always was – what we do here (he gestured to the garage gym) has to compliment what I do outside, not interfere with it. Right now – and this is specifically why I'm interested in hooking up with you again – I'm really into rock climbing. I feel like I'm making some good progress and I want to be able to keep that up.”

“We can do that. First, let's make sure you're getting the most from your climbing.”

I drew a series of circles on the white board that looked something like an archery target. The smallest ring around the bull's eye I labeled *beginner*. “This is where a climber learns the basics.

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Becoming familiar with different kinds of terrain develops the necessary skills to become well-rounded. Progress is steady, and *that's why* this ring is labeled “beginner.” It's not defined by how hard you climb.

“The first performance plateau every climber experiences is when they've hit this boundary right here.” I pointed at the circle separating the beginner's realm from the *intermediate*. “They've developed enough skill and capacity as a climber that recovery from climbing doesn't happen at the same rate. They're able to do more work at a greater intensity and this impacts the body more significantly. It may take a full week to recover. When you don't realize that your progress isn't linear anymore, that's when you've hit this plateau.” I pointed back to the circle that separated beginner and intermediate on my impromptu Rate of Adaptation Map.

“What do you mean by linear?”

“I mean that progress doesn't happen each time you go climbing. And it can be more than a temporary setback too. If you don't realize that you're able to do some damage in a single workout – enough that it warrants a full week's rest – can you imagine how you might get stuck in a rut?”

“So you're saying to take a week off from climbing?”

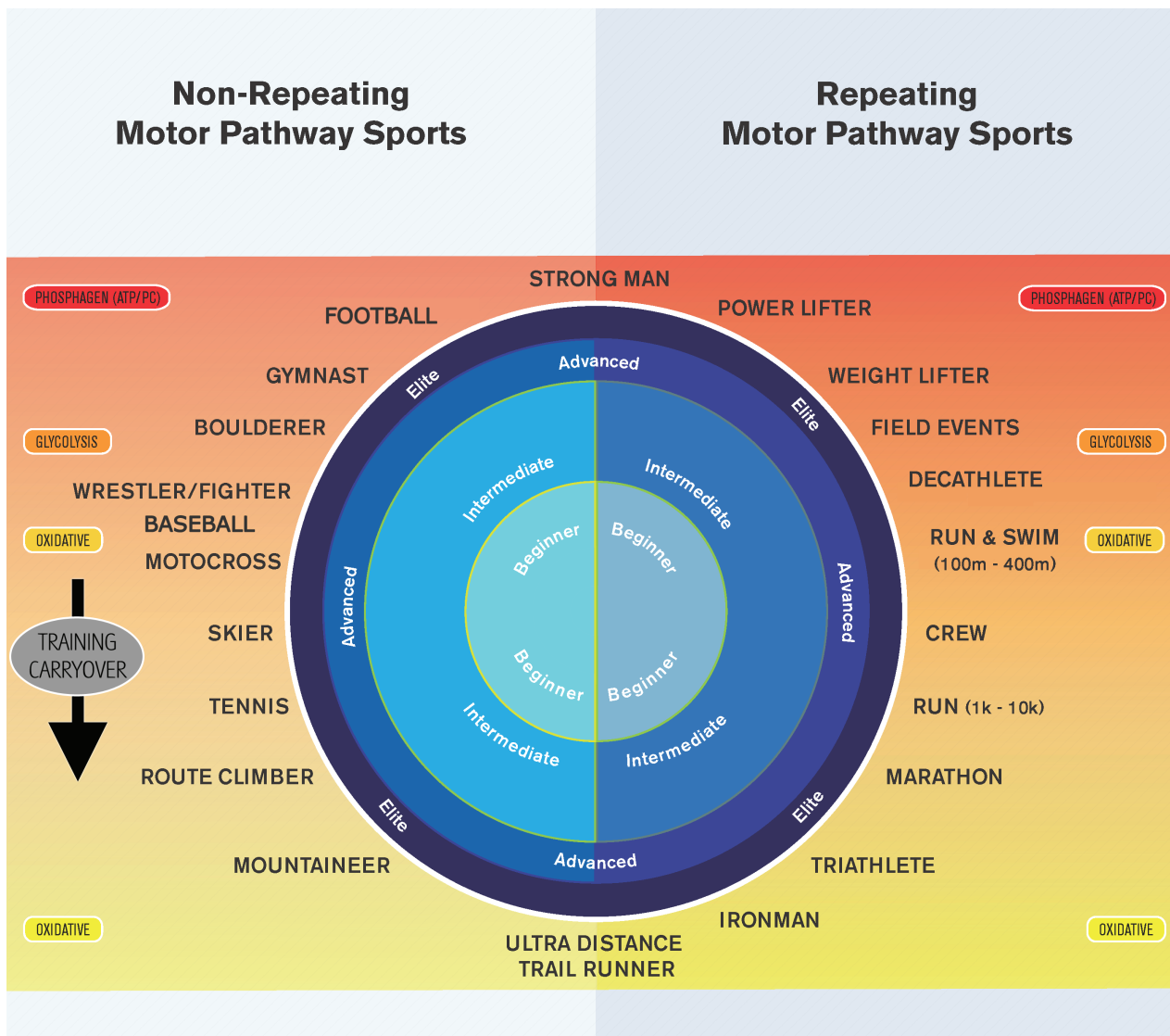


Figure 1. The Map.

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“I’m saying that if you’re *training*, then it’s time organize your climbing into a weekly period of work-to-rest for the best results. To get the most out of the climbing you are already doing, we’re going to organize your week around a primary session called the Heavy Day. This is the day, or a combination of days if you go climbing for the weekend, that will be driving your intermediate rate of adaptation. This is the stressor that your body will need a full week to recover from.

“It doesn’t mean the intermediate climber takes a week off. He needs to engage those skills during the week of active rest. This way, skills stay sharp and are ready to ‘neurologically fire’ when fully recovered. To accomplish a full intermediate recovery, you’re going to follow the Heavy Day with one Medium Day and one Light Day during the remainder of the week.”

“Do you mean take it easy by climbing easy ‘cruiser’ climbs on those lighter days?” he asked.

“That’s a good question, but no. You are going to climb at or very near your limit every day you climb. Light and Medium refers to the *volume* of climbing you’re doing on those days.”

“That doesn’t sound very ‘restful.’ ”

“Your body is conditioned to climbing. So *some climbing*, even at your limit, won’t inhibit your recovery. It’s when you don’t understand how to actively recover, or that it’s necessary, that so many climbers eddy in a performance slump *way* longer than necessary.”

“But climbing at my limit each day I go climbing? I’m not so sure about that.”

“I’m not asking you to train like this year round. But if you’re interested in seeing some improvements, then for right now, yes, this is the most efficient way to go about it. Climbing’s different from sports like swimming or weightlifting. A swimmer can’t practice swimming faster than they can swim. You can’t practice deadlifting 405 if you can only pull 365 off the floor. Those sports benefit from building a base in very specific movement patterns *repeated over and over*. Refinement in those motor pathways translates directly into baseline improvements.”

“What’s baseline?”

“Baseline is the ability at which you can consistently expect to perform. Using a periodization model like we’ve been discussing is helpful for consistently improving your baseline.

“And the difference between swimming and climbing is significant when you’re using a model like this!” If the target on the white board was a clock, I drew a radius from the center out towards nine o’clock and wrote “climber.” In the opposite direction, I drew a line outwards through all the circles and wrote “swimmer” at three o’clock.

“Now, look at these radius lines. They represent the *process* of progressing from beginner to intermediate, and later, from intermediate to advanced athlete. Let’s call this process a ‘trajectory,’ since it represents an outward path launched from the center. So, we’re talking about this area right here.” I pointed to where the “climber” trajectory intersected the intermediate ring. “I’ve described how an intermediate climber would effectively periodize a week’s worth of climbing: Monday, 4-5 routes at maximal intensity, Wednesday, 2-3 routes at the same maximal intensity, and again Friday, 1 route.

“If we’re talking about swimming,” pointing to where “swimming” intersected the intermediate ring, “or running, or biking, or even weightlifting – sports with a repetitive motor pathway – then one way those athletes have trained successfully for a long time is something like this. We’ll call it ‘build and taper.’” I wrote: Swimming – Monday, 8 x 800m at 75%, Wednesday, 6 x 400m at 85%, Friday, 4 x 200m at 95%.

“It may be simplistic and not entirely accurate because I’m not a swimming coach. But it *does* convey how the intermediate swimmer gets run down early in the week with a high volume of swimming at a relatively low intensity. As the week continues, the volume goes down and the athlete

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is able to recover, even though the intensity increased throughout the week. The swimmer directly benefits from that high volume loading by becoming more proficient *at a stroke that is repeated over and over* propelling them across the pool. That proficiency's applied to holding better 200m times than the previous week."

"So why don't climbers do that?" he asked.

"Well, we've tried. But it doesn't seem to work that well for all that long. Have you ever played tennis?"

"No, but I wrestled back in high school."

"What does a wrestler gain by wrestling someone who is 80% of his own ability? Which wrestler benefits?"

"Well, if it's not a rapid take down, then the more inexperienced wrestler who had to scrap it out just to prevent getting tapped out too soon would. They benefit from learning some of the other's more-experienced tricks."

"Precisely," I said. "And if you can imagine a tennis player that played 5 matches, all with different opponents at 80% of the better player's ability, one after the other, and they were all easily beaten, how would the better tennis player benefit?"

"I don't know. Tennis elbow?"

My friend had nimbly driven my point home for me with his practiced wit. After collecting ourselves from a good laugh, I pushed on.

"So why do climbers do the same thing as the example tennis player, and climb routes that don't really challenge their abilities – a bunch of sub-maximal work that doesn't challenge the skill set? Since there is *no specific motor pathway* being practiced – because the sport consists of myriad ways to climb any route – there is no point in the sub-maximal repetition. The worse case scenario is that the sub-maximal work at higher volume sets them up for injury when they *do* ramp up the intensity, like 'junk' miles on a bike for a cyclist."

"Okay, I think I get the 'intensity' thing. It's true, working at your limit is how you do your hardest climbs. And you know how it is – you can do the same hard climb three or four times, each time just a little differently, and that fifth try, the one where you 'send' your project successfully, you do something just slightly different that you've never *practiced* before. Because there was *no way to practice it*, that being the nature of the sport. So the 'intensity' of your climbing must stay high, because easy climbing does nothing for a climber. The 'volume' of climbing at a useful high intensity is the variable we have to manipulate."

"Exactly," I said.

"So you're saying that to get in as much of that kind of stimulus as possible while training, I have to increase the skill set. But why vary the program over only a week? Why not longer? Wouldn't I be making bigger gains if I climbed 'heavy' volume for a week, 'medium' volume the next, and 'light' volume for the third week?"

"At some point that might be a good plan for programming your climbing days. But right now, as an intermediate climber you may not be able to recover from 3 to 4 heavy climbing days in a single week. Even an advanced climber, if he's never consciously scheduled like this before, would easily see weekly progress by breaking his week into a heavy, medium and light day. At some point progress would stall, but he'd be primed to move into a more advanced schedule, similar to what you described."

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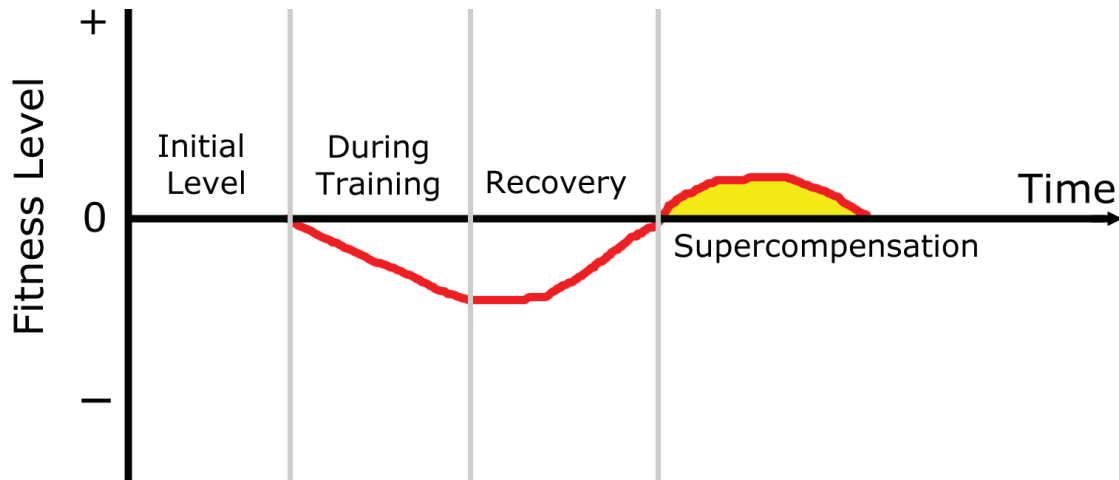


Figure 2. Supercompensation.

The question wasn't entirely wiped from his face. So I drew a simplistic model of the supercompensation model, illustrating training, recovery and supercompensation in relation to one's baseline level of ability.

"The body is simply responding hormonally to the physical stress of training. Too much suppression of anabolic hormones and the athlete suffers. Not enough of a stressor and there is no 'hormonal' response, because there's nothing to respond to. No stress means no adaptation – no improvement or athletic gain. The beginner has no problem initiating a stress event where the intermediate needs to be a little bit more deliberate about it. The difference at the advanced stages is that the athlete is so developed *in his specific sport* that it's really difficult to apply enough of a stress that the body will have a hormonal response."

"That stressor doesn't have to come from the sport you're training for. That's what happened to me when I got into CrossFit. Not identifying the unfamiliar stimulus was unfortunate. I could have saved a lot of valuable training time."

"What do you mean?" he asked. "It seems you were engaged for quite some time."

"I was, but what improved? Not my climbing; not after the original introduction. What improved was my CrossFit."

"Yeah, Rob, but you can't argue about it's effectiveness for everyone who's doing it and getting results."

"*But who's doing it?* And what are those results? All these people here," I pointed to the center circles of the Map, "can do just about anything because their bodies are easily impacted by physical stress. As a consequence they adapt. Does that make them a good indicator of a program's effectiveness? How you get to where you want to go on this Map has a lot to do with where you're starting from. When you know where you're starting, then you know about how fast you're going to be traveling to where you want to be. The more centered you are when you start, the more rapid your progress, and the further out from the beginner's center, the slower the progress."

"There's another thing about this Map." I turned to the white board and drew an "x" on the climbing line in the middle of the intermediate ring. I marked two more on the same line outside the circles at nine o'clock. "Chris Sharma and Tommy Caldwell are extremely talented climbers. They are

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examples of climbers who are very near to expressing the limits of their genetic potential. Moving in their direction is your goal.”

“Genetic potential?”

“If you develop 100% of the possible athletic ability you’re born with, you’re at your genetic potential. For instance, we’re born with a finite number of motor units – motor neurons hooked up to a certain number of muscle fibers – and we die with the same amount. There’s no changing the number of motor units we have. People with a freakish vertical jump or inhuman grip strength were born with a greater number of motor units. This and all the other stuff you can’t change determines your athletic potential. Your limb lengths, the quality of your nerves and muscle fibers, even your intelligence, can limit your ability to improve beyond a certain point. *But*, the stuff within your ability to control and improve can be brought up to your full potential to develop it, if you’re careful, dedicated, and smart about doing it.”

“The point I want to make with the Map is that these climbers, Sharma and Caldwell, who are using their genetic resources to their fullest potential in the climber trajectory, have also dedicated a lot of time to developing another trajectory. They each have the ability to do very difficult moves requiring a lot of strength and power, practiced on steep rock very close to the ground. If you think about it, bouldering is the epitome of high-intensity technical climbing, and is a sub-discipline of the bigger sport, so it’s really a different trajectory.” I drew another line from the center of the Map and wrote ‘bouldering’ at the twelve o’clock position.

“Are you telling me to start bouldering?”

“I’m trying to illustrate a point, but yes, your climbing would improve by increasing your capacity to do harder moves. As John Bachar said, ‘You can have all the endurance in the world, but if you can’t do the move then you can’t do the move.’ What’s important to understand is that training carryover works in a particular direction. Endurance climbers will benefit by bouldering but not the other way around. This is meaningful regarding our choices here in the gym if we want to make the most of our training time.” I stopped a minute to let this idea soak in.

“Strength takes the longest to develop but it also sticks around the longest. Endurance comes and goes almost by the week. Strength is persistent and has the greatest training carryover, like in our bouldering example.”

“Let me guess: this affects our choice of exercises here in the gym.”

“We need to choose the movements that have the greatest potential for creating the greatest amount of strength throughout the body. We want to become practiced and fully fluent in the five movements that have the farthest reaching impact.”

“Five movements?”

“Yes. Five movements. Strength development in the squat, press, deadlift, bench press, and clean is a lifetime endeavor. For athletic training purposes, these exercises will have the greatest impact for the longest time. Building general strength wakes up motor units that were previously dormant. This accounts for a lot of novices moving more weight without noticeable increases in physical size. An athlete, with the barbell, can increase strength by incrementally adding more weight. Depending on how long off-season training cycles are, this development can go on for years.”

“But Rob, you’ve lifted for years. You’ve probably exhausted the barbell for general training purposes.”

“There was a lot I was able to get out of the lifts after slowing down my conditioning work long enough to actually focus on the bar. Remember: too much conditioning inhibits strength gains, and

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conditioning is the less-permanent and more easily acquired adaptation. Strength benefits endurance, but it doesn't work the other way around.

"At this point, I run barbell loading alongside the primary climbing load. I taper the barbell to almost nothing during the active recovery phase from my climbing work."

"Fascinating stuff," he said. "For someone like me who's a recreational climber and interested in stepping up his game, I can see the value of working with a barbell. I've experienced it, and that wasn't even with this new and improved, *way* more deliberate approach you've been sharing with me for the past hour. It makes a lot of sense. But my question is this: what do you think about those outer circle climbers, including all the ones you didn't name? What do you think that you've described here means to them?"

"Every advanced athlete already has a relationship with a lot of what I've described. I think formalizing the concept might be helpful. More awareness means a better ability to manipulate what's already working. They know something about training carryover. Understanding how the unfamiliar stimulus can act as an effective outside stressor would be valuable. This will shed some light on some of the gains that weren't previously repeatable or explainable. I know everyone I've shared this information with has understood something more about their own training history. I think that's valuable for moving forward."

"What about the barbell for the international competitive climbing level? I mention it because I heard noise of climbing becoming an event in the Olympics."

"I'd love to know the answer to that question, but there's only one way to find out. There'd have to be a group of elite competitors who were exposed to good barbell training first. And that day isn't right around the corner any time too soon. I don't know what the stigma is that surrounds the barbell concerning climbers, but it's pretty thick. I'm not sure what it'll take to wake athletes up to the barbell's efficiency when it comes to improving their primary sport's training.

"It's so basic and simple. Five full barbell movements performed competently and regularly during training cycles, and the athlete – any athlete – increases motor unit activity, creating greater strength, a better connection to the body, and consistent improvement. What athlete *wouldn't* want to begin taking steps down that road? And the whole process can be described on this little diagram."

The Map: An Introduction

The idea of the Map never went away. Each conversation after that initial one revealed something new about it. The Map is a simple series of circles with ever increasing diameters. They represent an athlete's rate of adaptation. The closer an athlete is located to the center of the Map, the further he is from expressing his genetic potential, which means that the rate of adaptation will be faster. For example, as a beginner in any sport, an athlete's location on the map would be adjacent to the sport, but within the center of the circle. Improving the ability at this sport radiates his position outward, towards the perimeter of the Map. Adaptation naturally slows down the closer an athlete gets to the Map's perimeter. The outside edge of the Map – terminal adaptation – represents an individual's genetic potential, i.e. the absolute limits of performance for that athlete.

The Map is inclusive of every living human being. The center of the Map is where we all come from. The center of the first ring represents something like "non-active lifestyle" for the majority of those encompassed here. This is where the growing bulk of humanity resides, those content with the things in life that do not challenge their body's physical response to stress. The Map's outer boundary represents the relatively few individuals who have fully tapped their genetic resources.

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From the originating center circle, the rings increase in diameter and thin in width. “Stress” for so many in our culture is perceptive stress (overwork, mental stress, emotional stress, etc.), which then results in health issues. Stress is essential, because it causes adaptation, one of the hallmarks of life. Without it, we’re nothing. Whether the nature of the stress is real or perceived, the body is in a perpetual state of reorienting and responding to that stimulus. So it’s ironic that ‘health issues’ from perceptive stress are exacerbated when there is little or no exposure to physical stress. The labels outside the perimeter of the Map are examples of various sports. They are oriented in two ways, north to south and east to west. The north/south gradient represents the way energy is supplied to the body while actively engaged in a sport. Northern sports have rapid, explosive energy demands on the system, while southern sports have slower energy demands. Energy demand is calculated “in the moment” – the more energy required to perform the sport in the moment of highest intensity typical of its performance, the farther north it is on the Map. Conversely, the less energy required in any particular moment orients the sport further to the south.

This corresponds with how the body replenishes energy to the available pool of ATP (ATP is the basis of all muscular contraction, even breathing). Huge amounts of available ATP are used up rapidly in northern sports, the by-product being ADP, which is resynthesized back into ATP by breaking down creatine phosphate. This chemical system is called ATP-CP. Weightlifting, powerlifting, gymnastics, strongman, and throwing events are examples of sports that rely on a highly developed ATP-CP pathway.

Multiple pathways are working at the same time in these northern regions. One pathway does not shut down as another takes over. The Map does its best to represent this with a gradient effect. The aerobic system is always running, as is the glycolytic system, even as the ATP-CP ramps up with sudden and high demands on energy.

When energy demands continue to run high and the short lived ATP-CP system has run its course, the body begins to rely on *glycolysis* to continue ATP production. Track events lasting longer than 20 seconds quickly fall into this pathway. ATP-CP and glycolysis also fuel both sudden and sustained efforts on the football field and wrestling mat, which employs these higher energy pathways too.

All the while – before, during and after these higher energy systems have run their course – the aerobic system is busy supplying its quiet, steady stream of ATP. Stored bodyfat is mobilized and processed to produce ATP in the lower energy aerobic pathway; *beta-oxidation* is dependent upon the availability of oxygen for the chemical reaction. This is the default energy pathway of our existence, and the primary consumer of the Breath of Life – as long as you supply oxygen, beta-oxidation can supply most of your ATP. It’s when the energy demand is great that the higher-energy pathways take over. The aerobic pathway functions as our recovery system from higher energy outputs during a period of rest. It’s also an athlete’s fall back when high energy output cannot be sustained any longer. It’s almost visible as a runner settles into a slower cadence during a mile run, or painfully noticeable as a fighter goes into “survival mode” at the end of a lost fight.

Some athletes rely primarily on oxidative metabolism during competition while never going into a predominantly anaerobic state (glycolysis or ATP-CP) at all. The longer the distance or the longer the duration of the activity, the further that athlete is from ever accessing those higher energy systems and consequently, the further to the South his orientation on the Map.

Competing at sports on the equator on either hemisphere almost always necessitates training at the northern regions. Also, because of the sudden neuromuscular demands on the non-repeating side, there are also sudden demands on the body’s energy systems. The time spent in the ATP-CP and

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glycolytic regions of the Map, when spent wisely, supports the sudden bursts of exertion inherent in activity on the Western hemisphere of the Map.

The east/west gradient indicates whether a sport relies on repeating a very specific neuromuscular pattern or not. Sports that rely on accurately repeating a specific movement – a snatch, shot put, or high jump – or the same movement seamlessly repeated over and over – rowing, running or biking – are placed on the Eastern Hemisphere. Sports that do not rely on repeating a specific motor pathway, but rely heavily on interpreting the best course of action in rapid and immediate response to unknown variables – basketball, skiing or wrestling – are found on the Western Hemisphere.

The east-west gradient of the Map codifies the fact that sports are fundamentally different in neurologically important ways. Running places one foot in front of the other for either short distances at high intensity or long distances at low intensity. Either way, the motor pathway is repetitive and precise. Downhill skiing is an example of an activity that involves different combinations of movements every time it is performed, with no run ever identical to another. Skiing demands the ability to produce different combinations of movement patterns as the situation is encountered. Non-Repeating Pathway (NRP) sports are characterized by sudden, unpredictable demands placed on the body's energy reserves. Evaluating the placement of these different sports along the outside perimeter of the Map is a less exacting science than those on the opposite hemisphere.

Repeating Motor Pathway (RP) sports have a predictable and continuous draw on the energy systems. As such, the placement of different sports on the Map's perimeter has a predictable layout. The longer the distance of a running or swimming event, the further south its orientation will be. Conversely, the more explosive the effort, the more northerly the sports placement. Weightlifters generate the most power, and powerlifters lift the most weight; these sports create the greatest demand on available energy and they occupy the repeating pathway's most northern position.

Ultra distance trail runs and strongman events have something unusual in common: they have a foot in both worlds. The bulk of their training takes place firmly on the RP hemisphere, but during actual competition the trail runner who best interprets and accommodates the upcoming terrain will gain a significant edge that can play a role in winning the event. Similarly, strongman competitions have slightly different events with different implements; the ability to adapt to the different equipment, again, may give a competitor the necessary edge to outperform another. Competition will determine the sports orientation on the Map. So even though much of their training is repetitive in nature, the edge during competition is decidedly NRP. Any sport can be applied to the Map's perimeter with these two criteria: the energy demands placed on the body (north to south), and whether the sport relies on a repeating motor pathway or a non-repeating motor pathway for increased proficiency (east to west). The visual is helpful in organizing training time to make sure we are progressing in the ways that we want, deliberately rather than randomly. It also tells us how fast we can expect to progress relative to how close we are to expressing our genetic potential.

What became very obvious while dwelling on the ramifications of the Map is that there are many trajectories from the inside ring toward the outside that can naturally be pursued over the course of an athlete's career. But the closer an athlete is to expressing most of his genetic potential – the further out from the center of the Map – the greater the need for the effort to become more focused. Deliberate choices need to be made with regard to which, and how many, outward trajectories from the center will benefit the athlete most. Because training is a deliberate approach to systematically

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achieving one's goal, after 5 years of "Elite" distraction the first deliberate thing I did for my training as a climber was to stop pushing out in all directions on the Map at the same time in the pursuit of "increased work capacity over broad time and model domains."

The Map is a useful model for organizing one's thoughts around training effectively and knowledgeably. What I know from a lot of experience sharing this with others is that it makes plain some otherwise confusing and heady concepts that can make it difficult to see the forest for the trees.

The activities may be listed along the Map's perimeter but the process of athletic development begins well within the Map's interior. The activities being listed on the outside have to do with creating a trajectory for development. Reaching the outside limits of the Map means that you are up against your genetic potential *in that sport*. It is a rare individual that has exhausted all means to achieve greater abilities and capacities in his sport. But more importantly, an athlete on the outer reaches has developed other "supplemental" trajectories either by exploring other sports or deliberately pursuing physical qualities that his primary trajectory will directly benefit from. And this is one of the more significant implications of the Map.

The Map & the Body's Different Rates of Adaptation

The skills and abilities of the Beginner lack the capacity to do much damage to the body. In fact there's enormous room for the organism to adapt at a very fast rate. Careful planning isn't necessarily essential for results as a beginner, but the results will be strung out over a longer timeline than is necessary without a plan. As the Beginner closes the gap towards Intermediate (away from center), it becomes increasingly important to assist the body in this quick rate of recovery. Good sleep, ample nutrition, and rest days insure that further progress can be made from the previous training session.

The rings are not a measurement of one's ability. They represent the fastest rate that the body can sustain adaptation. When skills are honed and capacity has increased along a specific trajectory, there is no amount of sleep or nutrition that will sustain progress workout to workout. Performance in a specific sport will reach a plateau and something other than a linear progression needs to be considered *if one wants to move at the fastest rate of development*.

What the Intermediate and the Beginner have in common is that a single training session can disrupt homeostasis. Recovery from that disruption is where they differ. To regain equilibrium from an Intermediate overload event takes about one week. The Intermediate is conditioned specifically enough to his sport that the week's workouts, with reduced volumes of deliberately programmed intensity will maintain neuromuscular skills without interfering with the recovery process.

Some latitude remains in the planning (or lack thereof) within Intermediate athletes. Persistence and determination can make up for what coaches and athletes lack in understanding of the Intermediate's weekly rate of adaptation, but that takes time. Unplanned progress can still happen but this process is bumpy; performance can be erratic and often is. Progress is just more efficient when utilizing the appropriate periodization model specific to a sports trajectory. While many do bump around on the intermediate seas and make progress, they do so because they are still far from expressing their genetic potential.

The outermost ring – the advanced athlete – is another story. It is not at all forgiving, and without a basic understanding of the physiological processes of an extremely conditioned athlete, there will be problems. Greater and greater *resiliency* – the resistance to homeostatic disruption in the athlete's adaptive capacity – is developed throughout the Intermediate stage. This resiliency matures to the point that even well planned weekly progress stops. The athlete has become so conditioned to

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his sport that multiple workouts are required to generate a legitimate stress response. This begins the departure from the Intermediate ring of development into the Advanced, where multiple workouts are needed to elicit a disruption in homeostasis.

Long periods of time can transpire without any real change in an advanced athlete's baseline level of ability. As the outer rings of the Map diminish in width, the amount of time exponentially increases to traverse them. Few people realize what is given up in one's life to make room to develop a skill that approaches the absolute limits of what is possible to perform. The advanced athlete's rate of adaptation is slow. It takes a month (or longer) to run a full cycle of stress and recovery. This diminishing rate of return narrows the focus of one's training even more. Goals *must* become more focused with each training cycle, with the previous training cycle priming the next.

Prioritizing training time is weighed against the timeline of the upcoming season, event or competition in every stage of athletic development. Advanced training takes on a laser-like focus the further out on the Map one is, and it becomes less tolerant of any superfluous training "noise." Each training session has a clear purpose and all available resources go into achieving that purpose. The ratio of work to rest that productively drives adaptation no longer has a forgiving margin of error. The work is focused and deliberate, so that the body can be left alone to do its thing during recovery.

There are two things that will provide assistance for those who find themselves in this situation or happen to be coaching an Advanced athlete. The first is to make sure his time spent on his primary sport is well managed, relative to their rate of adaptation. The second thing to do is ***to provide the athlete with an additional trajectory that has the broadest impact with the longest lasting results.***

At this point, introducing a new training stimulus while maintaining whatever schedule the athlete has been following will elicit the desired response. Because performance has flatlined before the introduction of the new stimulus, recovery is not the issue, the athlete's developed resiliency sees to that. What has been missing from the program in this specific example is an adequate stressor. That stressor can come from a new source. It does not have to be generated by the sport-specific trajectory reaching the limits of the intermediate realm as seen by the Map. This entirely new trajectory may look different depending on the cross-training methodology.

At first, it does not matter what trajectory it is, as long it is unfamiliar to the athlete. The direction of the new trajectory, however, will determine how long the "novice effect" boost to the established sport will last. Running has a limited shelf life for non-runners. The muscle mass involved has only a limited range of motion. Swimming in non-swimmers may be helpful for a limited period of time too. It incorporates more working tissue and for the same reason it qualifies as a foreign stimulus, but it is difficult for many to gain access to a pool. These are popular methods to crosstrain because they are easy activities to learn. Little coaching, if any, is required to get started.

The Map & Alternate Trajectories (the North/South Phenomenon)

Alternate trajectories are meant to assist movement *away from the Map's Center* on the primary trajectory. Known for quite some time as "crosstraining," it is a method to develop physical qualities in the body that will assist the athlete in expressing greater potential in a specific sport.

In order to fully understand the map it's important to understand how the body operates – what systems are working and how. The basic organization of the neuromuscular system involves one motor neuron hooked up to many muscle fibers; this is called a "motor unit", mentioned in my conversation earlier. The body is electrical, and "electrical" motor units are either turned on, or they

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are turned off; they do not operate by degrees of on-ness. The body is also chemical and the energy to the electrical on/off switch is fueled from “chemical” sources. High energy demands or low energy demands each have their own unique source of replenishing “chemical” energy.

Using an alternate trajectory to develop an increase in one’s potential for energy output does not detract from the primary trajectory, rather it enhances performance in all trajectories. Whatever the demands of a primary trajectory, if one gains access to more motor units while deliberately developing an alternate trajectory, it will NOT detract from the primary line; rather, it will assist the athlete. Whether the electrical system is used methodically (RP sports) or irregularly (NRP sports), more trained and prepared motor units simply means greater potential to propel, control, and activate the body. The general program that activates the greatest number of dormant motor units will be of more use for a greater length of time than a program that recruits fewer motor units.

There is no parallel to the barbell in its ability to meet an athlete exactly where they are now in terms of neuromuscular efficiency and begin the process of progressively applying higher demands on the entire system. The neglect the barbell receives from both regular folks and athletes is something of a mystery, given its potential. Still, given that we live in a culture that sells products offering quick fixes or a “silver bullet” for most everything people are interested in, it is understandable that training with the barbell is undervalued or ignored. It takes time, like anything worth doing thoroughly.

The “loaded” barbell ranges from 10 pounds on up, continuing in as small as 1 pound increments to a limitless ceiling for the most diverse application of any resistance tool in the gym. The skill involved in moving a barbell correctly is an inhibitor, because it takes time and assistance to learn how to use it, and most gyms are starved for knowledgeable instructors to teach proper technique. Because of the previous collective move away from barbell training in the fitness industry, few trainers have appropriate knowledge of its value or how to teach people to utilize it.

Training carryover consistently works in one direction, from North to South. It’s possible for a new training stimulus to work in another direction, but this will only be temporarily effective. In an endurance setting, strength and power will always be expressed at a fraction of one’s overall potential due to the lower strength and power demands of endurance sports. Therefore, the increase in strength and power will directly benefit one’s endurance simply by increasing that overall potential, and thereby increasing the reservoir from which to pull that fraction. Conversely, endurance training will not improve strength at all, because its low strength and power requirements do not stress the ability to produce strength or power.

Increasing one’s capacity for energy output is pursuant of a due-north trajectory. This is the barbell’s domain. Encompassed here is more potential for consistent training carryover than any other direction on the Map. In the broadest sense, the barbell is similar to how bouldering works for endurance climbing – the higher-intensity adaptation benefits the less-intense application. From wherever you currently stand, improving your capacity for energy output – strength and power – will increase performance in all trajectories on the Map.

The Barbell and The Map

First hand experience with the “early” CrossFit days was my introduction to crosstraining in the gym, in an attempt to perform more capably outside on the rock. That was long before the slogan “increased work capacity over broad time and modal domains.” While it is the antithesis of what I consider an efficient program, the tool that separates CrossFit from P90X – the barbell – served

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me well, for a brief time. Resistance training was the new stimulus that ultimately prompted my involvement. Even done poorly, the compound multi-joint movements performed with relatively light loads were a potent stimulus that supported me as an advanced climber.

Had I known, I would have packed my bags after six months and learned how to do the basic barbell movements properly. It is almost embarrassing to write that those bags were not packed for another six years. But those six years introduced me to a lot of basic information and a few experts who had something of value to offer. Those same experts challenged an organization built by a few individuals with almost no credible background in either athletics or academia. It's in these past three years since leaving CrossFit that I have been able to clearly define what I now teach to my clients and what I believe to be the most effective methods for athletic and health gains.

Being strong doesn't mean that you'll become suddenly bulky or suffer a sudden drop in intelligence. Rejecting the option of barbell training is born simply from ignorance, fear, or both – ignorance or fear of the skill needed, or the resolve a loaded barbell demands from anyone getting under it.

Getting “generally” strong is just smart. Whether it is to increase lean body mass for health reasons or to gain an edge at the sport you love. Full range of motion basic barbell movements performed well will have the farthest reaching impact in support of *all* athletic endeavors. Essentially, strength improves the body's capacity to perform at a greater intensity. This is true for all developing athletes and remains true for even the most advanced.

After the initial gains have been developed and effectively translated into the advanced stages on your primary trajectory, full range of motion barbell movements support a greater systemic response that benefits sports-specific training. Practically speaking, if your primary line is anything other than due north the demands of your specific sport dictate that you will only be lifting seasonally. Seasonal lifters have to work back through a mandatory “reset” after the performance or competitive season.

The resiliency acquired from repeated adaptation to heavy training is very strong in advanced athletes. For those that have integrated years of barbell training, the next strategy will be to time multiple overload events, one right after the other, from each trajectory. Because it is so general and broad a stress, barbell loading comes first to ensure systemic activity. As the advanced athlete is culminating the primary sport's specific “overload event,” barbell training ceases or is dramatically reduced until the recovery phase is complete. This process is then repeated for as long as the training season lasts. The details on how to effectively do this are unique to each individual's circumstance. Planning cannot be careful enough. The purpose here is to include the precise amount of barbell work that can remain effective in conjunction with advanced sports-specific training.

It's unusual for a climber to advocate barbell training due to the overwhelming fear of increased body weight. Usually one thinks of football players, sprinters, field athletes, or fighters using weights in the gym. Depending on whom you talk to, tremendous latitude exists about what exactly constitutes a strength program, and the term is thrown around carelessly. The strength program I advocate for climbing is very *specific* to the sport of climbing, and for all the reasons mentioned in this article, it must be. But to achieve the *general* objective of strengthening the maximum amount of your musculoskeletal system, the exercises themselves are general in nature. To help encourage a systemic response using the barbell in conjunction with an advanced sports-specific training schedule it is essential to use as much of the musculoskeletal system as possible. The more muscle mass engaged in work, the greater the body's hormonal response will be – thus, the use of the five basic exercises previously described.

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So, front squats don't count. The hamstrings are not working as much as they could be; not working an important muscle group means your crosstraining is not as effective as it should be. Overhead squats don't count. The load's limiting factor is your shoulders' ability to stabilize the bar overhead in the sweet spot known as the "groove" or "slot," so the load can be squatted. It would be wiser and more effective to just press instead. Randomly programmed strength days within a sea of destructive conditioning will never amount to a strength program. Taking a perennial approach to conditioning is both unwise and destructive. Systemic inflammation of the aerobic system, a side effect of perennial conditioning, is not good for one's health either, let alone the ability to build the much more stubborn quality of muscular strength.

The squat is the single most important exercise there is. Nothing else recruits more tissue doing more work than this one movement. The full range of motion squat done properly is the most potent tool in the gym. The other four add balance and support to this central movement. The time it takes you to learn something in the gym has a lot to do with how long it will remain interesting and effective, no matter what your goals are. Correctly performed squats take some time to learn. Even if your sport does not require squatting, and most do not, there is enormous benefit from becoming fluent in this basic human movement.

It is important for individuals to have access to accurate, straightforward information to take productive control of their own training. The distinction between NRP sports and RP sports, for instance, will greatly improve the training efficiency of climbers. And the North/South gradient can aid the athlete in understanding how to avoid overtraining. The Map shown here is easy to understand and follow, a perfect visual aid to support your athletic and fitness programming.

Perhaps the misguided emphasis on cardio-respiratory endurance will shift when more people try alternatives to mainstream 'trendy' workouts. Maybe the idea that "more" is not better will begin to sink in. Possibly, more people will feel accomplished and satisfied with their training, using the Map and a barbell, rather than addicted to workouts that burn out the adrenals and provide little sustainable support to athletic progress. I hope this effort at organizing the key ideas helps you with your training.

Rob Miller has been a climber for decades. He has been featured on the cover of climbing magazines, established multiple first free ascents on several huge rock faces, enjoyed the sponsorship of a number of national outdoor enthusiast companies, coached two kid's climbing teams, and trained hundreds of individuals into better athletic performance, fitness and health. Rob lives on the coast of California with his family, but travels all over seeking climbing crags, big open sky, and ways to improve training for himself and his clients. www.granitepage.com

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