

# My First Half-Century in the Iron Game

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Probably the most generally overlooked and certainly the most widely misunderstood factor in the field of exercise physiology is friction; it sometimes appears that the law of physics do not apply in the scientific community, because they continue to ignore friction and if asked about it will usually try to deny its existence.

In the Universe (in this Universe, at least) everything that has both mass and motion also has friction, and muscles are no exception; if the effects of friction are ignored, it is then impossible to understand muscular function, yet in practice not even one out of a random group of 10,000 scientists now calling themselves exercise physiologists has ever given this critical factor a moment's thought.

People have been measuring the friction in muscles for many years, yet never recognized it for just what it is; usually, during the several thousand times I have mentioned the subject to such people, they either get a glassy look in their eyes and try to change the subject or look at me with a smirk and say something like... "Oh, where did you read that? Which long haired, dope smoking, scrawny PHD published that in which respectable peer-reviewed journal?" Smirk, smirk.

I have usually been tempted to grab their necktie and tighten it a few notches; and on a few occasions I did. But, generally, I accept the obvious fact that I am talking to a fool and let it drop. After all, as it says in the Bible... "Cast not pearls before swine."

Twenty-odd years ago, when so-called isokinetic exercise was introduced by Cybex, quite a bit was published on the subject of the negative (eccentric) part of exercise... which, according to those people at the time, was nothing short of evil, dangerous, to be avoided. This smear campaign against negative work was continued to the point where many people even today are literally afraid of it; one company in their current ads quotes some physical therapist on the subject... "I refuse to expose my patients to the dangers of eccentrics." Or words to that effect.

Almost all human activities involve both positive and negative work, or concentric and eccentric work as most scientists usually prefer to call it (after all, we must sound "scientific," right?)... while I prefer to avoid the Latin terms for the simple reason that they sound too much alike and are thus frequently confusing.

When you lift a barbell your muscles are performing positive work, and when you lower the weight back down you are performing negative work. A muscle that is becoming shorter (contracting) while producing force is performing positive work, but when the same muscle is becoming longer while producing force then it is performing negative work. Lifting a barbell during a bench press is positive, lowering the barbell back down to your chest is negative.

No small part of the confusion in this field is a direct result of the fact that there is little in the way of agreement regarding terms, and some of the terms that are used are utterly ridiculous. For example: when a muscle is becoming shorter the scientists call this a "concentric contraction," but when the muscle is becoming longer they call it an "eccentric contraction." In spite of the fact that the word contraction means (when applied to a muscle) to become shorter. The use of Latin terms by the scientific community was supposed to reduce confusion; but today, very few people in the scientific community can even write simple English ... or could it be that they are afraid to write simple English? Perhaps they believe that simple, plain statements would be too easy to understand and that it would then be obvious that they don't know what they are talking about.

Or, having made a simple statement, they then qualify it to death in obvious attempts to cover all bases in case they turn out to be wrong. Remember, these are the same people who are still trying to test strength with isokinetic devices, years after it should have been obvious to a goat that isokinetic tests are worthless for any purpose. But, then, I have met very few scientists who were as smart as an average goat, so I guess I should not be surprised.

And why do I hate the scientists so much? I do not hate them, but I am clearly aware of just what most of them are: fools, and arrogant fools at that. Scientists have contributed little or nothing to the field of exercise physiology apart from stupid theories and a few dangerous practices.

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Meaningful measurement of anything requires a tool that is capable of producing specific, accurate test results; yet most of the testing that is still being performed by scientists in this field still involves the use of tools that are worthless for any purpose. Apart from things that I have published on the subject during the last twenty-odd years, several other people have published articles that clearly spelled out many of the problems with isokinetic testing procedures, and some of these articles have been published in scientific journals; yet, in general, all of this was ignored. Among others, Alex Sapega, M.D., and Jules Rothstein, PHD, have clearly outlined the problems with such procedures. Both of these men happen to be friends of mine, but their statements on the subject of isokinetics were not influenced by me; Rothstein's work on this subject was published several years before I ever met him, and Sapega was clearly aware of these problems before I met him.

Prior to the time (about 1969) that Cybex started attacking the negative part of exercise, I had never given the subject much consideration; it was there, I was aware of it, but I never considered its relative value. So, in a very real sense, those people did me a favor: they called my attention to a factor of great importance that I had previously ignored.

But, once called to my attention, it required less than ten minutes of consideration for me to realize that the negative part of exercise was very important; without negative work, full-range exercise would be impossible ... without negative work, there would be no resistance at the start of movement and no resistance after reaching the end of a possible range of movement. But apart from those considerations I still did not know just how important negative work really was; but I knew how to find out.

So, in the spring of 1972, in DeLand, Florida, I initiated a research program in an attempt to determine the actual value, if any, of the negative part of exercise. Using several advanced bodybuilders, two professional football players, and a large part of the DeLand High-school football team as subjects, we started an exercise program that we then called "Negative Only." In general this is not a practical way to exercise, because it usually requires the assistance of several strong and enthusiastic helpers; but we were not looking for a practical method, our interest was directed elsewhere, we wanted to see what would happen if the exercise was limited to negative work, if the positive part of the exercise was avoided entirely.

The results?

Without a single exception, these subjects became stronger and larger so quickly that we could hardly believe it; and these were not "average" subjects at the start, instead most of them were already far above an average level of strength and muscular size at the start.

During these exercise sessions the subjects performed no positive work of any kind; instead, the weights were lifted by helpers with no assistance from the subject being exercised, and upon reaching the top position of the movement the weight was released by the helpers, and then the subject slowly lowered the weight back down, performed "negative only" work.

At the start of this program I had been performing heavy exercise in an on again/off again fashion for more than thirty years, either training very hard or not at all; but I had performed no exercise of any kind for several years, my most recent exercise having been 23 weeks of heavy, hard exercise that was performed about four years previously. During that 23 weeks of training I maintained exact records of my progress, strength, bodyweight, muscular size, etc. During that 23 weeks of training my initial increase in strength and muscular size came very rapidly, but I made no additional gains at all during the last several weeks, could not get any bigger or any stronger, was "stuck." So I quit training entirely.

But having seen the results produced by all of the other subjects by negative only exercise, I decided to try it myself. After only six weeks of such exercise both my muscular size and my strength were right back where they had been following 23 weeks of exercise performed about four years earlier; and these results were produced by only about ten percent of the amount of exercise that I had performed earlier. The only real difference in my results was the fact that I was 11 pounds lighter following six weeks of negative only exercise than I was after 23 weeks of normal exercise; just as strong, just as big, but leaner, more muscular, less fat.

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During the winter of 1972/1973, Casey Viator, an advanced bodybuilder that I had then been training for several years, and the youngest person to ever win the Mr. America contest (at 19 years of age in 1971) was injured in an industrial accident, lost a finger and then almost died as a result of an allergic reaction to a tetanus injection; under the circumstances he had to stop training for several months, so he reduced his intake of food in order to avoid getting fat while out of training, and he lost both muscular size and strength but remained quite lean.

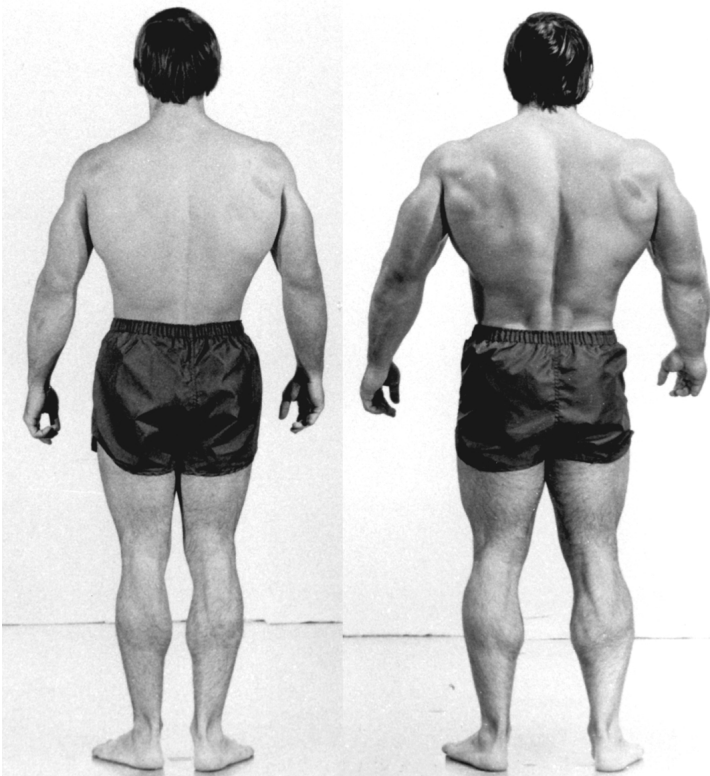
So I saw this as an opportunity to demonstrate just what could be done with a very brief exercise program, made arrangements with the Department of Physiology of Colorado State University, in Fort Collins, and went there for this research (really much more in the way of a “demonstration” than “research,” because I had a pretty good idea about just what the results would be), and this program was started on May 1, 1973 and continued for a period of only four weeks, 28 days, until May 29, 1973.

Results?

Compare the “before” and “after” photographs of Casey; according to the tests conducted by Dr. Elliott Plese and other doctors at the university, he gained more than 45 pounds of bodyweight while losing about 19 pounds of fat, which means that his gain in muscular mass was more than 60 pounds. Results that were produced by only 12 workouts with an average length of less than thirty minutes.

Now, nearly twenty years later, I believe that he would have done even better if he had used even less exercise; I believe that only two weekly workouts would have been better than the three weekly workouts that he performed.

None of which is intended to imply that you can produce an equal degree of results; Casey had several advantages that most people do not have, he had an unusual degree of potential for great muscular size that is rare, and he was rebuilding a level of size and strength that had previously been produced but had been lost, and it is much easier to rebuild than it is to build in the first place.



**Before: May 1, 1973, bodyweight 166.87 pounds.  
After: May 29, 1973, bodyweight 212.15 pounds.**

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During that program, Casey performed both positive and negative exercise, with the emphasis on the negative work; several professional football players from the Denver Broncos, including Lyle Alzado, trained in the same gym with Casey and helped him to perform a lot of negative only exercises.

Dick Butkus, who was suffering the effects of a terrible knee injury and had played out his contract with the Chicago Bears, visited with us there in order to give me an opportunity to look at his knee; I was not then, and am not now, a physical therapist, but nevertheless I rehabilitated what was nothing short of an utterly destroyed knee to the point that he was able to pass a physical examination performed by the doctors working for the Chicago Bears and was signed to a five year, "no cut" contract, meaning that he got paid for five years regardless of what happened later, whether he played or not. Which tells a great deal about the value of such tests (none), because Dick's leg was so bad that he damned near lost it at the knee.

When I first examined Dick's leg it was bent to the side by 23 degrees, was about to break off at the knee, and he could barely walk, and then only with great pain. Nevertheless, using primarily negative only exercise, we restored his strength to such a point that he was able to pass all of the tests given him by the Chicago "experts," and they were clearly aware of his injury at the time.

But, of course, the knee failed again, as I suspected that it would, his injury was simply far too bad to permit the violent movements required in football.

About a year later, in Oklahoma City, surgery was performed on his knee, and this almost consisted of cutting his leg off and then putting it back on again. I filmed this operation, and upon seeing the start of this film, upon seeing just what was done to his knee, Dick's wife, Helen, ran out of the room and vomited, and in no sense is she a wimp.

I have watched hundreds of operations, and have filmed dozens, but this was, by far, the most drastic procedure I have ever seen performed on a leg; with possibly one exception. When I was a child, a friend of my father's was shot in the knee at point blank range by a 12-gauge shotgun, and the lower leg was hanging on only with about as much tissue as that found in your little finger, the knee itself was gone. This man was carried into our house, placed in my bed, and operated on there and then by my father, and the leg was saved although it was stiff at the knee for the rest of this man's life; but, at least, he did still have a lower leg.

Dick's leg was not quite that bad but close.

Now, nearly twenty years later, and even with the surgery, it still gives him a lot of pain. But it is a hell of a lot better now than it was when I first saw him in 1973.

About two years ago, Dick visited us together with his son, a college football player who weighed about 260 pounds at the time of his visit, and we tested the strength of both Dick's leg and his son's legs; and, his previously injured and obviously atrophied leg, was stronger than his son's normal leg.

Why? How?

Because of differences in muscular fiber type; Dick obviously has a very high percentage of fast twitch fibers in his quadriceps muscles, which helps to explain why he was so strong and so fast while playing football, while his son has an opposite fiber type in his quadriceps muscles, largely (perhaps entirely) slow twitch muscle fibers in these muscles.

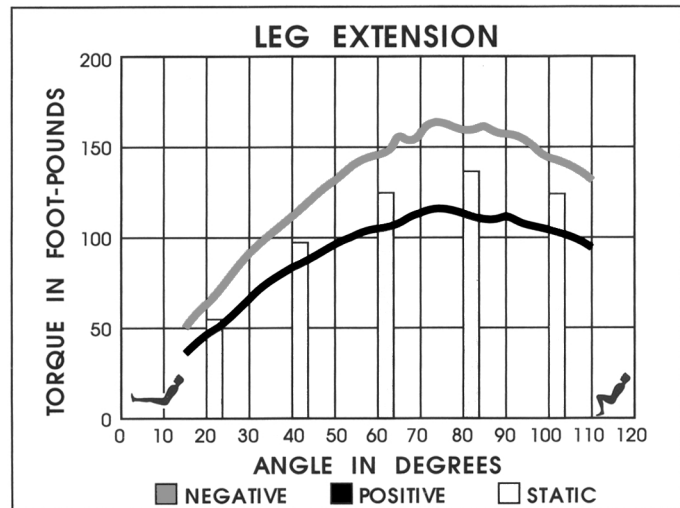
Dick's son's quadriceps muscles, because of this fiber type, are far more suitable for a marathon runner than they are for a football player, and in my opinion he will never be able to come even close to his father's earlier ability. Some can, and some cannot.

Remember what I said in an earlier article: atrophy is largely selective in regard to fiber type, fast twitch fibers atrophy to a greater degree than slow twitch fibers do. Which means that Dick, when we tested him a couple of years ago, had lost the function of a large part of his muscles fibers; yet in spite of this loss he was still stronger than his son.

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Cybox, and several other companies later, attacked the negative part of exercise for the simple reason that their exercises did not provide any negative work, consisted of “positive only” exercise; and I suppose that they were afraid that somebody might notice that the negative part of the exercise was missing and view that as a disadvantage (which it certainly is), so, since they did not have it, they started trying to convince people that removing the negative part of the exercise was some sort of an advantage, and a lot of people are still dumb enough to believe that.

A very large part of this outright superstition is result of an article that was published by Tom Pipes and Jack Wilmore a number of years ago, an article that supposedly proved that “positive only” (isokinetic) exercise was better than either normal exercise or negative only exercise; literally hundreds of thousands of copies of this article were distributed by Cybox as supposed “proof” of the superiority of their exercise, and the article is still being used in physical therapy schools and is quoted as fact in a number of supposedly scientific books on this subject. And this is being done in spite of the fact that this supposed study was clearly exposed as an out-right fraud; in fact, the study was never performed.



Proof? Damned right I have proof: I have a taped, three-hour-long interview with Tom Pipes during which he told me the whole story freely admitted that the supposed study was an outright fake.

Jack Wilmore, the stated coauthor of this study, and supposedly a very reputable scientist in this field, later stated, after the study was exposed as a fake, that he was out of town at the time the study was performed and thus had no personal knowledge of it. Really? Then why was he listed as a coauthor?

For some reason it appears that Jack does not like me very much; but that is a mutual opinion.

And just what does all of this have to do with friction in muscles? Quite a bit as it turns out. Look carefully at the above illustration.

The above chart shows the results of a three-part procedure that was performed to measure the fresh strength of quadriceps muscles. The bar graphs show the level of fresh strength of the muscles when they were tested with a static (isometric) procedure, while the lowest curve shows the coexisting level of fresh positive (concentric) strength and the highest curve shows the simultaneously coexisting level of fresh negative (eccentric) strength. Positive strength is lowest, negative strength is highest, and static strength is midway between the two.

At any given moment you have three very distinct and simultaneously coexisting levels of strength, positive, negative and static. Why? Because the friction in a muscle reduces your strength during a test of positive strength while increasing it during a test of negative strength, but has no effect during a test of static strength. Which also means that any dynamic test of strength cannot measure the true level of strength, will produce only an artifact.

Positive strength is equal to the force of muscular contraction minus friction, while negative strength is equal to muscular force plus friction. Positive is too low, negative is too high, neither is capable of producing a meaningful test of true strength.

Dynamic tests are also biased by impact forces, by the effects of gravity, and by nonmuscular torque produced by stored energy, all of which factors continue to be ignored (or even denied) by our competitors, Cybox and others.

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Well, they can deny these things until they are blue in the face, but by doing so they are trying to deny the laws of basic physics, which is nothing short of insanity; but, unfortunately, a lot of people have been misled to such an extent that they still believe all this hogwash.

I will return to the subject of muscular friction in later articles, because it is a factor of such great importance that it must be clearly understood for any meaningful evaluation of either testing procedures or exercise.

How many tests like the one shown above have we conducted? Thousands. And how often were the test results different? Never.

My earlier statement regarding a large part of the scientific community must not be misunderstood to mean that I am against scientific research; quite the contrary, I am a scientist, even if I do not have a degree from some university; in fact, I quit school after the ninth grade, but that does not make me stupid, and no amount of schooling will make you intelligent. Edison went to the eighth grade in school. The Wright Brothers had a High-school education. Einstein had only a High-school education. Tesla had almost nothing in the way of education. Yet those few people, none with much in the way of a formal education, did more in the way of changing the world than all of the scientists in history combined.

I have, or have had (many of them now being dead) a total of thirteen medical doctors in my more or less immediate family, my father, my mother, my brother, my sister, my daughter and so on; I could have attended medical school with my father's full support had I so desired, but I chose to do other things, many other things. After fifty-four years of flying, I still hold an Airline Captain's license, have flown more than 30,000 hours in everything from big jets to helicopters. Have designed, built, and tested damned near anything possible just short of a nuclear submarine (and, in fact, did build a nonnuclear submarine); which was a bit short of a success, it went down like a rock but did not come up worth a damn. Fortunately, the guy who tested it was good at holding his breath.

As I see the situation today, the biggest problem in the scientific community is a result of overspecialization; most such people have a very narrow focus, are not even aware of many things that would provide simple solutions to many of their problems. An average blacksmith would do much better in most cases; at least he is aware of things like hammers and levers, and knows why a wheel is round instead of square.

Additional problems result from considering "source" rather than "substance," which is nothing short of insanity. Who makes a statement is irrelevant, all that matters is what the statement says. The next time somebody asks you "where you heard something," smile and walk away, you are talking to a fool.

Max Planck, who got the Nobel Prize in Physics, and after whom the Max Planck Institute in Germany is named, had this to say on the subject of scientists ... "A new scientific discovery does not prevail by convincing its opponents and leading them to see the light, but only because its opponents will eventually die and then a new generation will grow up who are aware of the truth."