My First Half-Century in the Iron Game

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Just how much exercise is “enough”? And how much is “too much”? Those two questions have resulted in enormous numbers of widely-varying opinions and a lot of controversy during the last quarter century, and still no consensus has been produced.

Personally, it took me twenty-six years, from 1938 to 1954, to discover that two sets of each exercise produced far better results than four sets of each exercise. Then it took me another year to learn that only eight exercises in each workout produced better results than twelve exercises during each workout. By 1970, I clearly understood that best results from exercise were usually produced by only one set of each exercise. In 1986, I had learned that only two weekly workouts were usually better than three weekly workouts. Now, ten years later, in 1996, I know that only one weekly workout is required by most subjects, and that some people do better with a schedule of only one workout every two weeks, and that a few people do best on a schedule of one workout every three weeks.

When, in 1970, I introduced the first Nautilus exercise machines, together with the statement that only one set of each exercise was required, or even desirable, several people accused me of making false claims in an attempt to encourage the sale of my exercise machines; which charge, in fact, was utterly false, since my statements were based upon clearly established research results that could not be disputed.

And just what does science have to say on the subject in 1996? As it happens, surprisingly little; but most of what little has been published on that subject clearly supports my statements mentioned above,

Three days ago, on January 19, 1996, Dr. Michael Pollock, of the School of Medicine of the University of Florida, gave me a copy of a study that he had just completed, a study that I was not even aware of until after it had been written up for publication.

This study included careful consideration of the results of several research projects conducted by members of Dr. Pollock’s research staff and also considered every other study that they were able to discover by a careful review of the entire scientific literature: in effect, “everything ever published on the subject in any scientific journal.”

Results? ONE: in 1962, a Ph.D. named Berger, using 177 subjects for a period of 12 weeks, and using the bench press as the exercise being tested, compared the results of one set to the results of both two and three sets. One set increased the average strength of that group by 23.6 percent; two sets increased strength by 24 percent, only four tenths of one percent better than one set; three sets increased strength by 26.3 percent, only 2.7 percent better than one set. Whereupon Berger concluded that one set was as good as two but that three sets were better. Well, in fact, any such slight differences fall well within the differences of random variation, and certainly do not indicate any slightest differences in results.

Secondly, considering the fact that Berger was using healthy but previously-untrained college-age young men as subjects, his overall results were somewhere between pitiful and God awful. The starting strength of his subjects was very low, which means that they had the potential for rapid and large-scale increases in strength, yet failed to produce any such results.

In contrast, thirteen years later, in 1975, using military cadets as subjects during a study at the U. S. Military Academy, West Point, we produced an average strength increase of 60 percent in a period of only 6 weeks; so our results were more than twice as good as Berger’s even though we trained our people only half as long as he did his. And, of course, we used only one set of each exercise.

TWO: in 1982, a man named Silvester, using 48 subjects, compared the results of one set of biceps curls to three sets. One set increased strength by 24.6 percent within a period of 8 weeks while three sets increased strength by 26.2 percent, a difference of only 1.6 percent; again, a difference so slight that it is meaningless; or, as they say in the scientific community, “non-specific,” or “no significant difference.”

THREE: in 1983, a man named Stowers, using 28 subjects, during a program that continued for 7 weeks, compared one set to three sets in both the squat and the bench press. And found, again, that there was no significant difference.

FOUR: in 1986, a man named Westcott, using 79 subjects for a period of 4 weeks, while comparing one set to two sets, actually produced somewhat better results from one set than he did from two sets; but, again, the difference was not significant since one set increased strength by 11.2 percent while two sets increased strength by 10.8 percent.

FIVE: a later study performed by the same man, Westcott, performed in 1989, using 127 subjects, both men and women, and lasting for 10 weeks, using both dips and chin-ups as exercises, found almost no difference in results from one set, two sets, or three sets.

SIX: in 1993, Dr. Pollock's group, using 140 subjects, for a period of 12 weeks, using the cervical-extension exercise, compared one set to two sets and again found no meaningful difference.

SEVEN: in 1995, Dr. Jay Graves, using 141 subjects for a period of 12 weeks, with lumbar (lower-back) extensions as the exercise, and comparing one set to two sets, produced quite a bit better results from one set than he did from two.

EIGHT: in 1995, a man named Starkey, using 83 subjects for a period of 14 weeks, with both leg extensions and leg flexions as the exercises being tested, compared one set to three sets; in both cases, extension and flexion, one set proved to be better than three sets.

AND SO IT GOES: in some cases one set was better than either two or three sets, and when multiple sets did seem to be better the difference was so slight that it was meaningless. The American Academy of Sports Medicine has now accepted, as its recommended protocol, "one set to failure, not more than three times weekly;" which, frankly, I still believe is too much for most people, and is required by nobody. I get several calls a week from strangers who tell me about the great results they are producing by only one weekly workout, or even less exercise. In the field of exercise, at least, while it is true that "some exercise" is good, it does not follow that "more exercise" is better; in fact, more is usually worse. Remember: exercise does NOT "produce" results; instead, if properly performed, it "stimulates" results.

I sincerely hope that you can learn from my earlier mistakes, and can learn a lot faster than I ever did; if not, by the time you do learn anything of value about exercise it will probably be far too late to help you.