

Nautilus & Athletic Journal Articles

The AE Factor

The relationship between strength and anaerobic endurance

The two charts shown on the third page presents a dramatic example of a factor that has been the subject of enormous controversy for a period of several years... the AE Factor, AE for anaerobic endurance.

Some subjects display an enormous amount of anaerobic endurance... others have almost none. Up to May 30, 1986, we have conducted this type of test on a total of approximately eleven-hundred subjects... and to say that the results of these tests have been stunning would be a gross understatement.

We are dealing here with measurement of the 'effect' of exercise, the immediate consequence of exercise... not the 'results' of exercise, the eventual consequence of exercise; rather, the immediate loss of strength that is produced when a subject is worked to a point of momentary muscular failure, to a point where continued movement against the selected level of resistance has become momentarily impossible.

We are thus conducting measurements to determine the individual's relationship between his maximum strength and his anaerobic endurance. This relationship varies enormously from one individual to another... it is almost certainly genetically determined, and it does not appear to be subject to training. You are probably born with a certain ratio, and you will probably die with the same ratio.

But if that is true, why worry about it. Why worry about something that you cannot change? Because... this one factor can be the only difference between a champion and an outright failure, everything else being equal.

Because, secondly... a knowledge of this factor, and how you measure up, can tell you the sort of activity that you just might be very good at, and the areas in which you will certainly fail. And, because, thirdly... an awareness of your own ratio will tell you how to exercise for good results, and what you must avoid.

Some subjects require exercise involving very high repetitions... for them, low- to medium-repetition exercise as it is now performed by most people is probably a waste of time, producing little or nothing in the way of benefit at best. Such exercise will probably not hurt them, but it will not help them much either... they are simply wasting their time and effort. They need very high repetitions.

Some other subjects literally cannot tolerate high-repetition exercise... for them, such exercise is utterly devastating; trained with high repetitions, such subjects will rapidly lose both strength and muscular size. These subjects need a style of training that would be worthless for many other people... but a style that is an absolute requirement for them.

I have been aware of this factor, the AE Factor, for more than fifty years, and published articles on the subject more than twenty-five years ago... but only around 1986 did I finally become aware of the real importance of this factor.

For several years now, a rather hot debate has been waged on this subject by a number of people... with little or nothing in the way of agreement, understanding or proof; but now we have proof... now we can measure this factor with a very high degree of accuracy.

Fifty years ago, I assumed that individual differences in regard to this factor were a result of individual differences in the nervous system... I assumed that some people could recruit a higher than average percentage of their total number of muscular fibers during a maximum-possible effort; such people would be far stronger than they appeared to be, but would have very little anaerobic endurance.

Up to 1986 there was a lot of speculation on the subject of different types of muscle fibers... but not by me; I knew very little about different types of muscle fibers, and claimed to know even less... because I try to avoid forming even opinions until and unless I have some reliable method of confirming them.

So we knew what we were measuring here, at least in a sense.. but we did not even claim to know just what was responsible for the factor that we were measuring. Perhaps we had discovered a very accurate, non-invasive method of

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determining fiber types, perhaps... and perhaps not. Maybe we have discovered a method of measuring the factor that I once called neurological ability... and maybe not.

And maybe we had discovered a way to measure some combination of these factors, or maybe we had found a way to measure some unsuspected factor that nobody ever ever dreamed of.

We didn't know, and we didn't claim to know... but we did know the importance of this factor, whatever it turned out to be. I will remind you that nobody in their right mind would even attempt to explain either light or gravity... but we can measure them both, and we can take advantage of the opportunities afforded by both light and gravity, and we can avoid the problems associated with both light and gravity. And we can do so even without the slightest idea of any value on either subject.

We do not know just how widely this factor varies, from one individual to another... but we do know that the variation is wide, very wide. So far, from a fairly small sample of approximately eleven-hundred subjects, we have already measured a variation that exceeds forty to one.

Chart 1 shows a subject with enormous anaerobic endurance, while Chart 2 shows a subject with almost no anaerobic endurance. Both of these subjects were exercised in the same manner, and to the same degree... both subjects were given a level of resistance that was calculated to produce momentary muscular failure after a certain number of repetitions. An anaerobic level of resistance, high enough that they would be unable to continue after a few repetitions.

Then both subjects performed as many repetitions as possible, stopping only when it was impossible to continue, when it was no longer possible to produce movement. Both subjects were able to perform only six repetitions, and then, because of momentary fatigue, were unable to move against the selected level of resistance.

Both subjects were tested before the exercise, in order to determine their starting level of strength... and were tested again immediately after the exercise, to determine the loss of strength produced by the exercise, the 'effect' of the exercise, the immediate consequence of the exercise.

The subject in Chart 1 produced almost no effect, almost no loss in strength... the actual effect was just over one percent. Very, very little.

In startling contrast, the other subject produced an effect of 43.94%; almost forty-four percent, nearly a forty-four percent loss in strength from only six repetitions.

Chart 1

Effect produced by work to failure by a subject showing a high level of AE Factor.

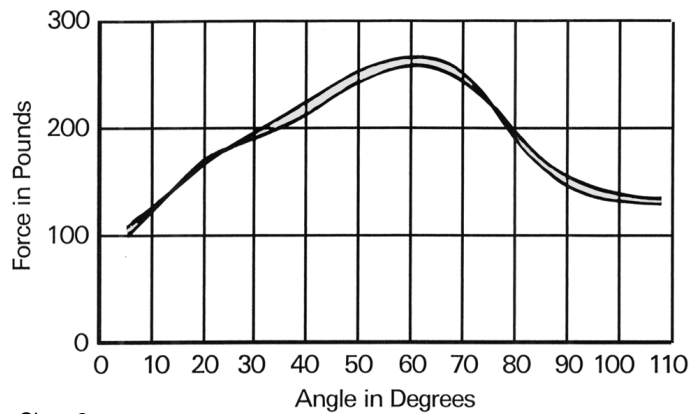


Chart 2

Effect produced by work to failure by a subject showing a low level of AE Factor.

