

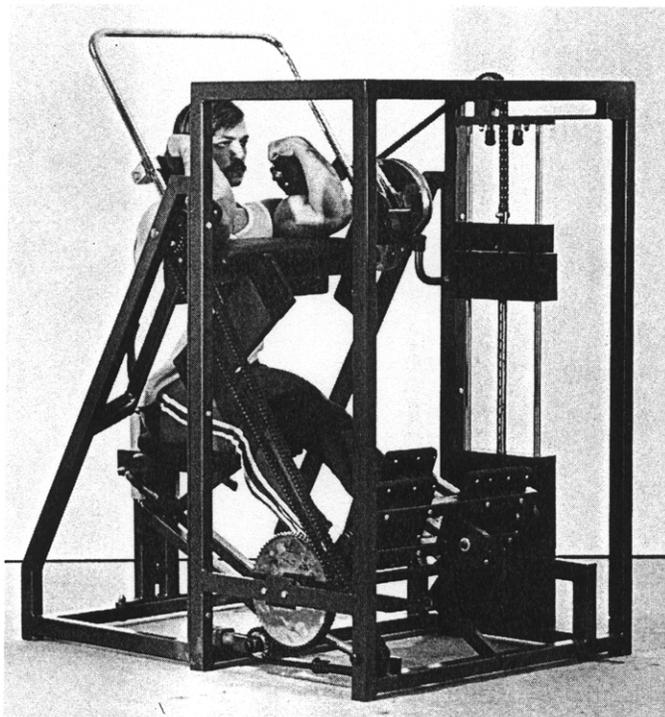
# Nautilus & Athletic Journal Articles

# Improving Functional Ability... In Any Sport

Human performance is a product of five factors... (1) bodily proportions, (2) neurological efficiency, (3) cardiovascular ability, (4) skill, and (5) muscular strength.

All of these factors are important... but it should be clearly understood that only one factor is actually productive; the other four factors being supportive in nature.

Ideal bodily proportions for a particular activity may be almost entirely responsible for a championship performance... if the other four factors are at least average; but bodily proportions perform no work on their own, their contribution to performance consists of providing the working muscles with an advantage in leverage.

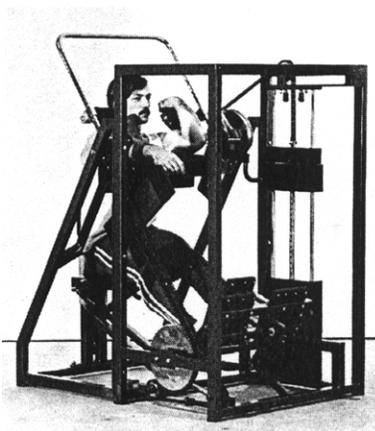


Superior neurological efficiency is also important for a high level of performance... but again, it performs no work itself; it merely permits the muscles to work with a higher than average degree of efficiency.

Cardiovascular ability is an absolute requirement for life itself... and a lack of cardiovascular ability will certainly prevent a high level of performance; yet... no amount of cardiovascular ability will perform work. Movement is produced only by the working muscles.

Skill may well be the single most important factor in any activity; but skill cannot perform work. What it does do is provide the working muscles with the ability to work at a higher level of efficiency... it channels the force produced by the muscles into a proper direction; and helps to prevent the waste of energy involved in an unskilled performance.

So all of the first four factors are important... but none of them do the slightest amount of work. The fifth factor is the only one that is actually productive... all of the others help, but only the muscles perform work.

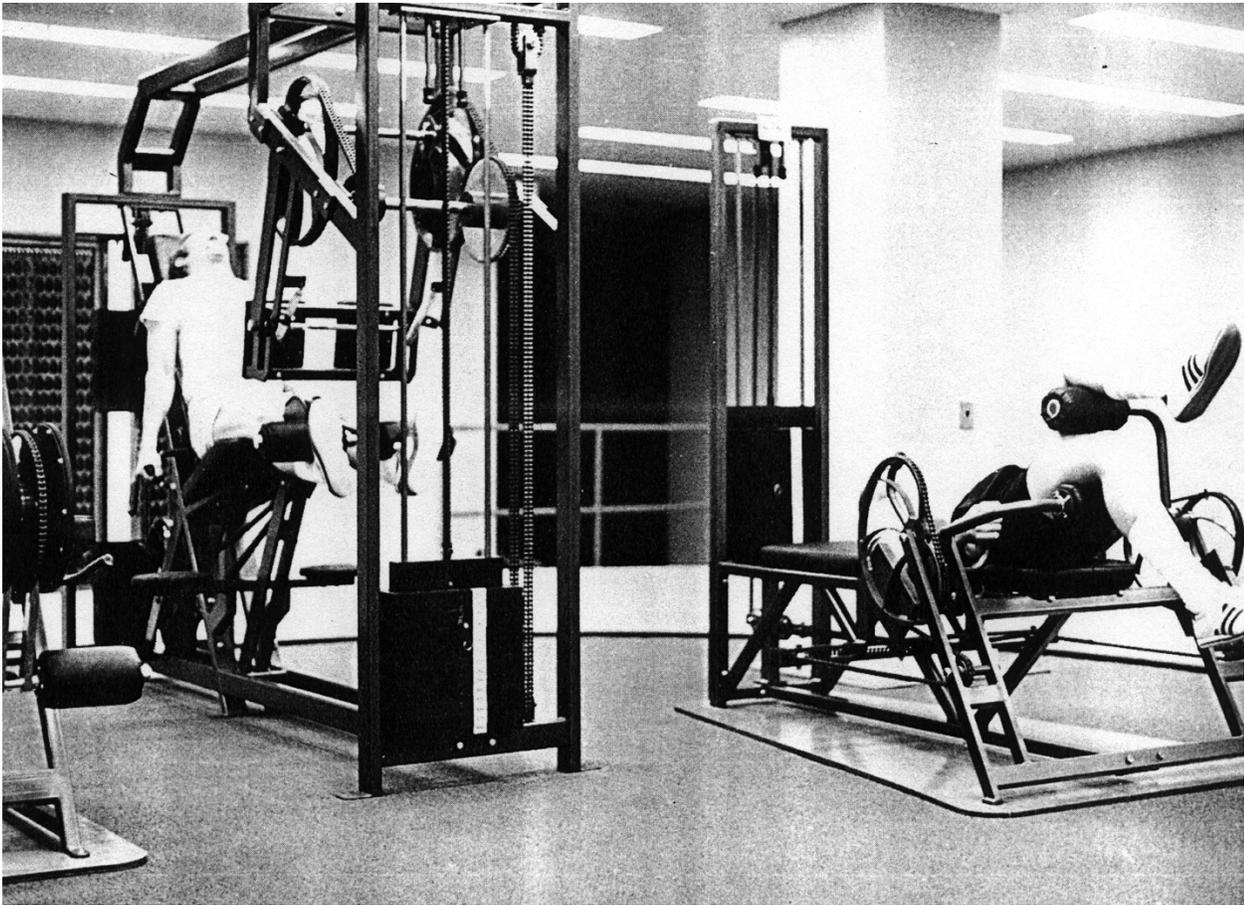


**A Nautilus Omni Curl Machine allows both "positive" and "negative" training without the aid of a training partner.**

When the above points are understood, it becomes obvious that the five factors should be divided into categories... four "supportive" factors in one category... and one "productive" factor in another category.

AND... the same five factors should be divided into two other categories, since two of the five factors are determined by genetics and three are not. In a practical sense this simply means that two of the factors cannot be improved... and that three factors can be improved. So our attention and efforts should be restricted to the three factors that can be improved.

## The Arthur Jones Collection



The Nautilus equipped training area at the Athletic Center of Atlanta

Absolutely nothing can be done to improve either bodily proportions or neurological efficiency, we must do the best we can with what we have... these factors are either good or bad, but are outside our realm of control in any case.

But we can do something about the other three factors... these can be improved, and should be. At this point in the history of sports, a very high percentage of training is devoted to the improvement of skill... and it should be, since skill is probably the single most important factor in most activities. Cardiovascular ability is also given a lot of attention... and again, it should be; since a lack of at least adequate cardiovascular ability will certainly limit performance.

In a sense, cardiovascular ability is linked very closely to skill... with results only from the practice of a particular activity; which activity will also help to produce the require level of cardiovascular ability. Skill in basketball (for example) is produced only by playing basketball... and the level of cardiovascular ability required for basketball is produced by the same training.

Additionally, most athletes also practice some form of training that is intended only for the purpose of increasing cardiovascular activity... so in most sports cardiovascular ability is given the degree of attention that it deserves.

Thus, in practice, two of our three improvable factors remain largely neglected. And, as it happens, the neglected factor just happens to be the only actual productive factor on the list... the only factor capable of producing movement, the only factor able to perform work. Muscular strength being the neglected factor.

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Muscular strength, I am tempted to say, is almost the “feared factor”... and it is certainly the “misunderstood factor”... a misunderstanding based entirely on superstition, ignorance and outright fear.

The power-train in an automobile consists of several related parts... all of which parts are important, but only one of which parts is actually productive. The engine produces power... which power is transmitted by the transmission... to the drive shaft... to the differential... and, finally, to the axle. The power produced by the engine cannot be used without the help of the other required parts of the power-train; but only the engine actually produces power... only the engine performs work... only the engine provides energy... only the engine produces movement.

The power-train in a human works much the same... several factors are required for performance; but only one factor is actually productive... only the muscles produce power... only the muscles perform work... only the muscles produce movement.

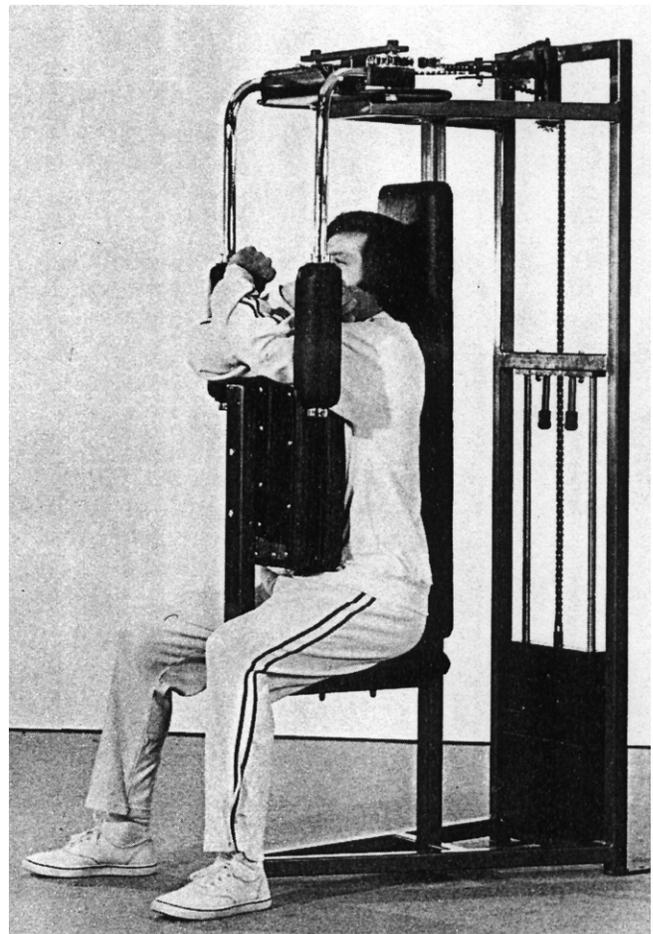
When considering an automobile, most people are clearly aware of the importance of a powerful engine... yet many of the same people utterly fail to realize that powerful muscles are equally important in a man. In fact, the situation is actually worse than that... many people, probably most people, are literally afraid of powerful muscles; afraid in the sense that they sincerely believe that powerful muscles will somehow limit their performance, reduce their functional ability. Such fear is based on superstition, with no slightest basis in fact; but it is a common fear, a widespread fear, a “well established” fear, a sincerely believed fear... and being so well established, it is a fear that is difficult to remove with the light of reason.

So we will be stuck with the results of such a groundless fear for a long time into the future, perhaps forever... thousands of injuries will be produced that could have been prevented, much pain will be suffered that could easily have been prevented, and the level of human performance will remain lower than it could have been and should have been.

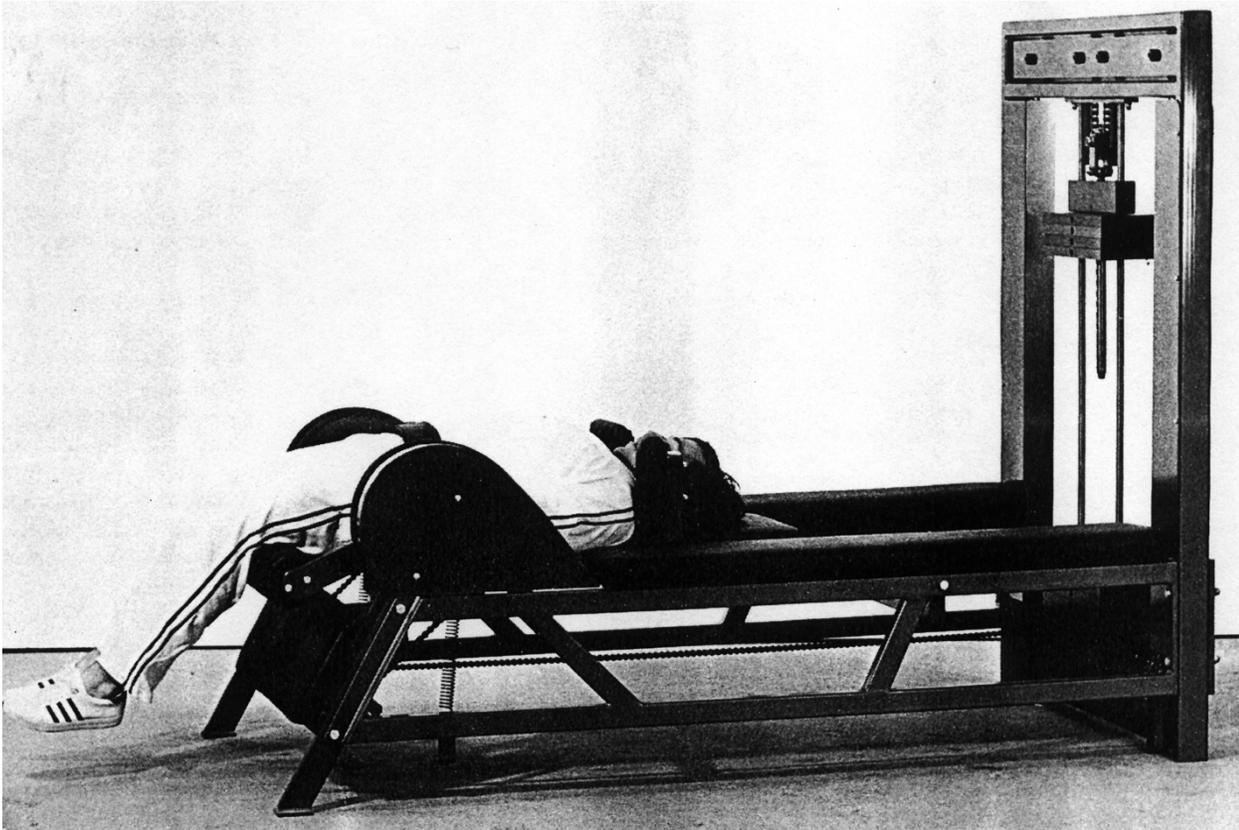
Thus we have already paid, are now paying, and will continue to pay a very high price as a result of fear based entirely on ignorance.

Individuals vary, on a gross scale... but a particular individual will reach his own limit of functional ability only when all three of the improvable factors are improved as much as possible. Additional improvement is impossible only when skill, cardiovascular ability, and strength have all been raised to the highest possible level consistent with the requirements of a particular sport.

Yet, in the real world, we have a situation where literally thousands of coaches and millions of athletes are doing little or nothing in the way of improving strength... usually because they are actually afraid to increase strength; afraid they will reduce the speed of movement... afraid they will reduce the range of movement, or flexibility... afraid they will somehow limit functional ability. All of which fears are utterly without foundation... all of which fears are based on false beliefs that are the exact opposite of the truth.



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Stronger muscles will make you **FASTER**, not slower, in any sport... proper strength training will actually increase your flexibility, in any area of movement... greater strength will improve your functional ability in any activity related to sports.

And greater muscular strength will go a long way in the direction of preventing injuries.

So, in sports, exercise remains the neglected factor... a neglect largely resulting from fear, a fear based on ignorance. Sometimes in the far-distant future people will probably look back on the present era of sports as the age of ignorance... primarily because of the lack of attention now being given to the intelligent use of exercise. Most athletes will finish their careers with absolutely nothing in the way of strength training... and very few (if any) athletes are producing even fifty percent of the potential benefit of a properly conducted program of exercise.

Well under two hours of total time devoted to proper exercise on a weekly basis will produce 100% of the potential benefits of strength training... three weekly workouts of less than forty minutes each are all that are required; longer workouts, or more-frequent workouts, are neither necessary nor desirable.

Exercise performed for the purpose of increasing strength should be brief, infrequent, and of very high intensity... as "hard" as momentarily possible, carried to a point of momentary muscular failure. Conducted in this fashion, strength training not only can be brief but literally must be brief; more than three such weekly workouts would actually result in a reduction in strength instead of an increase.

But again superstition rears its ugly head... common belief tends to equate "more" with "better"... in effect, if **SOME** is good then **MORE** must be even better; which may be true of some things, but which certainly is not true in the case of proper strength training. The widespread result of this myth being that the few people who do train for strength almost always train far too much... and seldom train with a high enough level of intensity.

## The Arthur Jones Collection

So even the few people who are aware of the potential benefit of proper exercise usually miss the mark by a wide margin... another result of ignorance; in this instance the ignorance being a result of a lack of accurate knowledge, rather than a belief in a baseless fear.

As a result of the widespread fear of exercise, and lack of factual information on the subject of exercise, most coaches and athletes are overlooking a very important factor... while continuing to labor under the mistaken belief that they are doing “everything possible” in the direction of improving functional ability. The “edge” that most coaches are constantly looking for has been in plain sight for a long time... but remains largely untapped, unsuspected, even feared, and certainly misunderstood.

Nothing in the above should be misunderstood to imply that strength is the most important factor... and there is no implication that the other factors are unimportant. On the contrary; the importance of proper bodily proportions for a particular activity is so great that this one factor may be the difference between a champion and an utter failure... with little or no regard for the other factors.

Likewise, skill is almost always the most important factor in any activity. And neurological efficiency (or a lack of it) can easily be the difference between success and failure. And, of course, at least adequate cardiovascular ability is required for any activity.

So all of the factors are important... and a champion in any sport is usually superior in every respect; with perhaps on exception... his strength is seldom what it could be, almost never as high as it should be, and his performance will thus be less than his real potential. He may be the best in the world... but if his strength is not as high as possible, then he has never reached the real limit of his individual ability.

Until this simple truth is clearly understood and accepted... until the obvious implications are applied in practice... functional ability will remain less than it could have been.

Strength is “general”... the application of strength is selective; the proper use of strength in any activity comes only from the practice of the particular activity. Skill is required for the proper use of strength, and skill is produced in only one way... by the practice of a particular activity.

Gymnastics may well produce the strength required for swimming... but the skill required to use that strength for swimming can come only from swimming itself. And no amount of skill at swimming will move you through the water without the strength to move your limbs... and your limbs are moved by the strength of your muscles.

The proper development of skill requires the application of a great deal of time to the practice of a particular activity... and such a large amount of training literally prevents the utilization of high-intensity training methods. The result being that training conducted for the development of skill is not the best type of training for increasing strength. Proper strength training for increasing strength must involve very high intensity... which literally cannot be practiced frequently nor for prolonged periods.

So a swimmer will build a certain amount of strength from swimming, while developing skill at swimming... but he will never build the degree of strength that is actually helpful to a champion swimmer; he will never build such a level of strength from swimming itself. And the same thing applies to a football player, a basketball player, or an athlete in any sport.

Some sports demand “overall” strength... and some sports require strength only in some areas; for example, a gymnast requires great strength in the torso and arm muscles... but does not require an equal degree of strength in the legs. Whereas, a football player needs overall strength.

So exercise should be applied selectively, depending upon the sport in which an athlete is involved.

But, regardless of the sport, and regardless of the area of the body being trained... certain basic rules must be applied if good results are to be expected from exercise performed for the purpose of increasing strength. And here we get into another area of widespread myth... an area of misunderstanding that literally prevents the production of good results from exercise in many cases.

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Without attempting to become involved in a lengthy refutation of any of the many common misconceptions in this area, the rules for proper exercise can be stated very briefly; use full-range exercises to assure development of the entire length of the involved muscles, and to increase flexibility... perform all movement in a rather slow fashion, avoid all sudden movements or jerking, and pause briefly at both ends of the movements... continue the exercise to a point of momentary muscular failure, which point should be reached after ten to twelve repetitions working against as much resistance as possible... pay careful attention to the form, or style of performance, and do not permit form to deteriorate in an effort to use more resistance or increase the resistance whenever possible, but not until more resistance can be handled without a sacrifice to form.

Properly performed, only one "set" of each of ten to twelve exercises will produce very good results in almost all cases... multiple sets are seldom if ever required for the purpose of increasing strength, so long as each exercise is continued to a point of momentary failure in good form.

If several sets of an exercise are used, then it quickly becomes literally impossible for an athlete to involve maximum intensity in each set... and attempting to do so will produce losses in strength instead of gains; so multiple sets are neither necessary nor desirable in most cases... the primary exception being a competitive weightlifter who obviously must develop skill as well as strength, the skill required to lift a weight in a particular fashion.

And do not be misled by advice to the effect that you must train "explosively" in order to build "explosive strength"... such a style of training is the least productive style of training possible, and by far the most dangerous style of training. Such training has little if anything to offer except the high probability of injury.