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ArthurJonesExercise.com

Size or Strength

More than twenty years ago, it was clearly stated in print in Iron Man Magazine, "…the strength of muscle is in direct proportion to its size."

Unfortunately, the choice of words used at the time was such that most readers – and from all appearances I am tempted to say "all readers" – missed the implication: or worse – simply failed to understand what was being stated.

So let me put in very simple terms …

1. To increase the strength of a muscle, you MUST increase its size.
2. Increasing the size of a muscle WILL increase its strength.
3. If all of the other factors are known and allowed for, then an accurate measurement of the size of a muscle will clearly and accurately indicate the strength of the muscle – and vice versa.
4. There IS a DEFINITE relationship between muscular strength and muscular size.

Once the above points are clearly understood, the implications are obvious; (a) bodybuilders, who are primarily interested in muscular size (with or without actual muscular strength) MUST train for maximum-possible muscular strength in order to build maximum-possible muscular size – and (b) weightlifters, who are interested only in strength, MUST train for maximum-possible muscular size in order to build maximum-possible strength. Most readers will probably fail to understand the above points – at first; some readers will refuse to accept them even in the end – but they are NOT opinions, they are simple facts, even if (as happens to be the case) facts that have been overlooked or misunderstood by the very people who need to understand them the most. The reader is, of course, free to "believe" anything he cares to – but I will again point out that you cannot change physics, and I just as certainly did not discover them – and in many cases I do not even understand them; but I am, at least, aware of them. In this article, I am primarily interested in making other people aware of the physical principles involved in the above-outlined points – and secondarily interested in explaining the implications insofar as weight-training is concerned.

But right from the start I want it clearly understood that these principles are NOT related simply to Nautilus exercise machines or training systems – these basic points are FULLY and EQUALLY and UNAVOIDABLY applicable to ANY type of physical training, for any purpose.

Also, right from the start, it should be clearly understood that you can NOT compare any individual to any other individual on a meaningful basis; except in cases involving identical twins, it is impossible to make any sort of rational comparison between two men – and even in cases involving identical twins there is still enough difference to make such comparisons less than totally accurate.

But this does not mean that you cannot make comparisons; you certainly can make meaningful comparisons – but only by comparing a man to himself at another point in time.

Arnold Schwarzenegger probably has at least three times the muscular bulk of his friend Franco Columbu – yet Franco can "lift more weight" than Arnold can; which means absolutely nothing, since the amount of weight lifted is only one of many factors that must be considered in order to determine strength. Franco certainly has more "usable strength" – but this is neither to his credit nor to Arnold's discredit; instead, it is a simple accident – an accident of birth, an accident determined by heredity.

Secondly, the "actual difference in usable strength may not be as great as the "apparent difference" – as the following simple example will clearly prove. Arnold's forearms are much longer than Franco's – thus, when Arnold curls a barbell, he must move the weight a much greater distance than Franco does when curling the same weight; if Arnold's forearms are three inches longer than Franco's, then he must lift the weight six inches more than Franco does – and thus he is performing more work than Franco is, even though both men are "lifting the same amount of weight."

Thirdly, Franco's "attachment points" may be more favorable than Arnold's are; if Franco's tendons are attached a greater distance away from the joint of the elbow than Arnold's are, then he is blessed with an advantage in leverage – given this advantage, he could lift more weight even if his forearms were the same length as Arnold's, assuming that all of the other related factors were at least equal.

Fourthly, Franco's "muscular efficiency" may be higher than Arnold's is; a cubic inch of Franco's biceps muscle may be capable of producing more power than an equal amount of muscle in Arnold's arms.

Fifthly, the very size of Arnold's muscles puts him at a disadvantage; while it is perfectly true that doubling the size of Arnold's muscles will also double their power potential, it does not follow that such an increase in muscular size will produce a proportionate increase in "measurable strength" – because, as the size of a muscle is increased, its "angle of pull" is unavoidable changed. Which changes will, in some cases, be to your advantage – but which, in most cases, will be to your disadvantage; in effect, while the power potential (or strength "input") will rise in proportion to an increase in muscular size, the measurable strength (or strength "output") will not increase in proportion.

But because of a general failure to understand the above points, most weight trainees are firmly convinced that muscular size has little or nothing to do with muscular strength; and as a result of this widespread misunderstanding, bodybuilders and weightlifters have gradually drifted apart – until finally we have reached a point of separation where the styles of training practiced by bodybuilders have little in common with the training routines used by weightlifters.

Some day this will be understood – and the information will be put into practical application by a large number of trainees; and when that day comes, then you will see some weightlifting records that appear literally impossible at the moment: 1,000 pound bench presses? 1,500 pound full squats? Who can say? But one thing is certain; when a man that is blessed with a combination of high muscular efficiency, good attachment points, and all of the other favorable factors mentioned above, does train in such a way that he produces maximum-possible muscular size, then he will also be so strong that his strength feats will literally dwarf the best performances of today.

The best lifters of today are strong primarily because of favorable accidents of birth; in many cases, these advantages are so great that a man can lift literally enormous poundages with actually very little muscle mass – but what could the same man do if his muscular size had been developed to its maximum-possible point? Which seldom if ever happens – because, an individual that is blessed with such advantages is seldom even aware that more muscular mass would make him even stronger than he is; and such a man is seldom "pushed" by enough competition to bring out his real potential.

It may well be that the Russian lifters have already realized the obvious implications of these simple facts – note, for example, the most unbelievable muscular development of the lower backs of some of the Russian lifters. And while I am reasonably certain that the Russian lifters are using every type of drug you ever heard of – and probably some drugs that none of us ever heard of – it still remains true that it takes muscles to lift weights; and, believe it or not, understand it or not, agree with it or not, the more muscle you have the more weight you can lift. Adding muscular size will ALWAYS make you stronger – and increasing your strength will ALWAYS increase your muscular size.

Franco might outlift Arnold even if he (Franco) had only a 14 inch arm – but Franco with a 15 inch arm will outlift Franco with a 14 inch arm, and Franco with a 16 inch arm will be stronger than Franco with a 15 inch arm; so long, at least, as the increase in size is an actual muscular increase. Adding size by increasing fatty tissue will NOT increase strength; a recent visitor to DeLand had an arm that measured 18 1/8 inches hanging relaxed at his side – but only 18.25 inches when bent and flexed. When he asked me "why" he had only an eighth of an inch difference, I told him, "…because you can't flex FAT."

Standing relaxed on the stage, Casey Viator does NOT stand out over many of his competitors – some of whom are actually more impressive than Casey is, when standing relaxed; but when Casey flexes his muscles he seems to grow right before your eyes – because almost all of his size is muscular size. Dr. Elliott Plese, of Colorado state University's Department of Physiology, remarked that he was not particularly impressed by Casey's arms, " … until he flexed them." But then he said, "…I simply couldn't believe what happened."

Chuck Amato shows the same sort of change between his relaxed appearance and his flexed appearance; and for the same reason – because his size is muscular size.

For years, most bodybuilders have made the mistake of "bulking up" – gaining size by adding fatty tissue, intending to reduce just prior to a contest; but no amount of fatty tissue will increase muscular size – and it won't win a contest, either. If training is properly conducted, then almost all additions of size will be in the form of muscular tissue, and there will be little if any need to "cut down" just before a contest.

Apart from physique competition, there is little if any advantage to trying to maintain an extreme degree of muscular definition – but it is just as certain that more than an actually very small amount of unrequired fat will always be a disadvantage; Paul Anderson is certainly strong, but he is just as certainly too fat – he would perform better with less fat, whether he is aware of it or not. Your car may run well with the trunk full of sand – but it will run better without the sand.

For as long as I can remember, many people have claimed as much as 20 inches of difference between their relaxed waist measurements and their normal chest measurements; but I have seen only one individual, who actually had such a difference, Sergio Oliva. And, as Sergio himself freely admits, while this is certainly an advantage in a physique contest – it is just as certainly a disadvantage when it comes to lifting weights.

Before he ever thought of entering a physique contest, Sergio was an Olympic lifter – and a good one; but he would have been a much better lifter if his waist had been considerably larger. Now – let it be clearly understood that I am NOT suggesting that it would be to his advantage for Sergio to add fat to his waist; I simply mean that the accident of heredity that gave Sergio his proportionately tiny waist (and his waist size is NOT a result of his training) also prevented him from making full use of the strength of his legs and shoulders in competitive lifting.

Thus it should be clear that an advantage for physique competition will frequently be a disadvantage for weightlifting – and vice versa; but it does not follow that bodybuilders should train differently – weightlifters and bodybuilders should train in almost exactly the same way, and someday they will. And the sooner the better.

Many leading bodybuilders will never be extremely "strong" – no matter how they train. And many leading weightlifters will never show much in the way of a physique by present bodybuilding standards – regardless of the way they train. But the same laws of basic physics apply with equal validity to both bodybuilders and weightlifters – as well as to football players, swimmers, and the participants in any sport where strength and endurance is an advantageous factor.

In the lighter weight classes (in weightlifting), and in some other active sports, it is NOT an advantage to build a maximum-possible muscular size – or, at least, not in all of the muscular structures of the body; 18 inch arms, for example, would NOT be an advantage to a sprinter – since they would contribute little or nothing to his usable strength as applied to running, and they would add to the weight that he had to move.

But increasing the size – and thus the strength – of the muscles that are involved in an active sport will ALWAYS improve the performance of the individual concerned.

And since that, too, is subject to gross misunderstanding – I will clarify that last statement a bit; the human body is a "unit" – it must be treated as such, and it will ALWAYS react as such. There is a definite limit to the size that you can build the legs to without increasing the size of the upper body markedly; thus, in practice, a runner could not build maximum-possible muscular size into his legs without increasing the unusable weight of the upper body to a point where the weight would be a greater disadvantage than the increased strength of the legs could compensate for. In effect, greater muscular size will always produce greater strength – and, everything else being equal, greater strength will always produce better performances in any physical activity; but in practice, other things don't "remain equal" – and thus adding strength sometimes demands a price that is not justified.

Secondly, since building muscular size (and thus strength) in any muscle demands training time and training energy, and since the overall recovery ability of the individual will always be limited, it should also be obvious that building such size may not be justified even in some cases where the increase in strength would not produce an unacceptable increase in weight.

In practice, almost everything is a compromise – and since the numbers of such possible compromises are almost literally infinite, I will make no serious attempt to list them; participants in active sports must attempt to work out such compromises on an individual basis – but an awareness of the previously outlined factors should make such determinations a bit easier.

By and large, most weightlifters come much closer to training properly than most bodybuilders do; but on the whole, very few trainees – bodybuilders, olympic lifters, or power lifters – train properly. Primarily, I think, because they simply don't understand the actual factors involved – basing their opinions on hearsay or common belief rather than up on facts; and the very fact that apparently good results are produced in at least "some" cases is merely proof of the productivity of systematic weight-training – rather than proof that the training was "right."

Let it also be clearly understood that I don't even claim to know just what constitutes "correct training" – but I am, at least, aware of a number of commonly-practiced training styles that are NOT correct, or even logical. The primary advantages of current training practices of weightlifters (as compared to the training styles of most bodybuilders) are twofold; by and large, weightlifters train harder than bodybuilders do – and, secondly, they train less than bodybuilders do.

Almost all bodybuilders train far too much – too often, too many exercises, too many sets – and few bodybuilders train anywhere near as hard as they should; most weightlifters train much harder than bodybuilders do, but not hard enough – and most weightlifters avoid the common bodybuilding mistake of training too much.

Muscularity (muscular definition) is primarily determined by dietary considerations – and to a degree by hereditary factors, and even by age; if weightlifters watch their diet as closely as most top bodybuilders do, and if they trained all of their major muscular structures in much the same manner that they train for their lifting specialties – then they would produce physiques much like those of bodybuilders, and as a result of far less work than most bodybuilders devote to the same final result.

None of which is meant to imply that the current style of training used by weightlifters is exactly right – it isn't; but it is a lot closer to being right than the training style of most bodybuilders – or, at the very least, it is "less wrong" than the training of most current bodybuilders.

Unfortunately, however, weight-trainees share more misconceptions and poor training habits than knowledge; which is a bit surprising, since many weight-trainees are medical doctors or members of other professional groups who should have the educational background to at least understand basic physiology – but who, in practice, still seem to unhesitatingly accept the outright stupidities recommended by muscle-heads who aren't even literate.

The physiques of two of these men are certainly outstanding – but they are just as certainly results of heredity to a far greater degree than they are results of proper training. I do not mean to imply that the individuals mentioned are not products of their training – they are; nobody ever "just grew" to such muscular size. But the same individuals could have obtained the same results from a lot less training, in a much shorter period of time; and who can say what they might have produced if they had trained properly? Proper training would probably have given them even better final results – but since that is obviously in the realm of conjecture, it cannot be stated as a fact. However, it is a fact that most of their actual training was wasted – and that most of it was wrong – and that much of it actually held back their progress.

An actually very small amount of training is all that is required to maintain existing levels of muscular size-strength – and it should be self-evident truth to anybody that any exercise in excess of the amount required for maintaining the status quo should produce the result of stimulating additional growth; and it will, if the exercise is "hard enough" to meet the intensity-of-effort requirement for such growth stimulation – but if not, then it is simply wasted effort.

Secondly, if the "amount" of such exercise (the amount in excess of the required for maintaining existing levels of size-strength) is too great, then growth will be impossible even if the intensity-of-effort is great enough to stimulate growth. For all practical purposes, it appears that exercise cannot be "too hard" – but you certainly can (rather easily can) perform "too much" exercise. Insofar as the exercise itself is concerned, there are actually only two factors of importance – intensity-of-exercise and amount-of-exercise; which two factors must be rather delicately balanced in relation to each

other. Almost anything which will increase the intensity-of-exercise is a step in the right direction – so long as this can be accomplished while keeping the amount-of-exercise within the limits imposed by the recovery ability.

Growth is a result of "over-compensation." Or, at least, this is true in regard to growth that exceeds normal development. A clear understanding of this process can be gained by a logical examination of the following simple example; an example concerning the formation of a callous – an example chosen only because such growths occur in plain sight, where they can be easily observed, where the cause-effect relationship is undeniable.

The skin on the palms of your hands is "naturally" thicker than it is on the backs of your hands – for a very good reason; and this extra thickness will occur on the palms even if you never perform anything in the way of work that actually requires it – it is "natural growth." However, if you perform hard work involving the use of your hands, work that brings your hands into contact with abrasive objects (or even "hard" objects), then the natural thickness of skin on your palms may not be enough to protect your hands; in which case you will develop a callous in any area that is exposed to such work.

Or at least you will IF THE CONDITIONS ARE RIGHT.

But the conditions must be right; first, the work must be hard enough to stimulate the growth of a callous – second, the work must not reach an amount that will prevent the growth of a callous.

If you work hard, the growth of a callous will be stimulated – but if you work too much, the growth cannot take place.

No amount of rubbing the palm of your hand "gently" will stimulate the growth of a callous – so it is not the amount of contact that causes a callous to grow. But if, instead, you rub your palm only once – BUT RUB IT HARD – then the growth of a callous will be stimulated.

However, if you rub it too often – or too many times – then no callous will result; because, even though the body may be trying to form a callous, it is easily possible to remove the extra tissue faster than the body can provide it.

At the risk of over-repetition or over-simplification, let us go over this situation one more time – in the most simple terms …

1. Your palm has no callous.
2. You rub the palm gently with your finger – but repeatedly, and often.
3. No callous will ever result – because no extra thickness of skin is required to protect the hand from such contact. The normal thickness of the skin is adequate under the circumstances – extra protection is not needed.
4. Then you rub the palm once with a file – hard. And you repeat this action once each forty-eight hours.
5. A callous will start to form almost immediately – and will quickly grow to a great thickness.
6. Because the normal thickness of the skin cannot provide adequate protection under the circumstances – extra protection is required, and the body will provide this protection in the form of a callous.
7. This is "over-compensation" – the body replaces the normal thickness of skin that was reduced by the pressure of the file, and then over-compensates by adding extra tissue in the form of the callous.
8. If the conditions are exactly "right" then the growth of a callous will be very rapid – and this growth will continue to a point almost beyond belief; to a point where the palms of the hands will be protected by a layer of tissue as thick and hard as the soles of your shoes.
9. But if you rub the file on your palm "too often" or "too much" then no callous will ever result – because you will remove the extra tissue as fast as the body provides it.

The growth of human muscular structures takes place in a very similar fashion – for similar reasons; part of such growth is natural – but beyond a certain point, growth must be both "stimulated" and "permitted." Such "extra" growth will not occur unless it is stimulated by heavy demands upon the existing levels of muscular size-strength resulting from natural growth – and it cannot occur unless the recovery ability of the system is able to both compensate and overcompensate at the same time.

If all of the recovery ability of the system is used up in efforts to compensate, then nothing will be left for the over-compensation which produces growth in excess of normal growth.

In practice, most bodybuilders quickly fall into a pattern of training where the "amount" of their training uses up all of their recovery ability – and growth thus becomes impossible. Secondly, they seldom train "hard enough" to stimulate over-compensation – so little or no growth would occur even if their system was capable of over-compensation.

The situation is made much worse by the fact that very few trainees (even world-famous bodybuilders) seem to have any real idea of just what is actually required in the way of exercise to cause over-compensation; most body builders are interested in "the appearance of great strength" (with or without actual strength in proportion), and they are firmly (if falsely) convinced that muscular size has no relationship to muscular strength.

Almost all bodybuilders are firmly convinced that they are "training very hard" – but, in fact, I have never seen a single bodybuilder who trained as hard as he should; almost all bodybuilders confuse "amount of training" with "intensity of effort" – and, too, most bodybuilders are simply not willing to train in an actually "hard" manner.

They believe – they WANT TO BELIEVE – that they can produce the same results by training "more" by performing more sets, or more exercises, or training more often; which is at least understandable, since it is certainly more pleasant to do an extra set than it is to do the extra two or three repetitions that should have been performed at the end of the first set – but such wishful thinking won't change facts, and no amount of extra sets will make up for a lack of the final, actually productive, repetitions that most bodybuilders skip.

In a set of ten repetitions leading to a point of failure during the tenth repetition, the first seven or eight repetitions are simply "preparation" – they do little or nothing to stimulate growth; but they do use up part of the recovery ability that makes growth possible. Thus – if the last two or three repetitions are not performed – then the set was wasted: worse than that, it actually did some harm to your progress – because, while it did nothing to stimulate growth, it did exhaust part of your recovery ability.

All of which is so simple, so self-evidently true, that it seems ridiculous to even have to say it; but most of which seems to remain a mystery to most weight trainees.

Many bodybuilders are perfectly willing to take dangerous drugs that they know little or nothing about – simply in an effort to improve their "recovery ability," which is the purpose of such drugs; and it never seems to occur to such people that their normal recover ability would be more than adequate for any amount of possible growth if they didn't waste it performing unnecessary sets and exercises. But it should, at least, be of interest to intelligent readers that the so-called "growth drugs" do little or nothing for a normal, healthy individual; nothing worthwhile, at least – nothing but expose him to the dangers of becoming impotent. Which, of course, is their own affair – but which they should at least be made aware of.

The use of such hormones has produced some rather spectacular cures in individuals suffering from asthma – and it has also produced a very high percentage of directly drug-related deaths; which last point has been overlooked or even suppressed – certainly not given the publicity it deserves.

And now, because of an avalanche of requests for such information, I will briefly turn to a more personal note: a recent telephone call came from a man who said he wanted to ask me some personal questions, and since I was out at the time he asked my secretary how old I am. He said that he had heard that I am seventy-two years old

My secretary told him, "…oh, no, Mr. Jones is a very young man." Which reply probably gave the caller the impression that I am in my early twenties.

But then, "old" or "young" is a matter of viewpoint; perhaps the caller would have done well to ask my secretary how old she is.

Actually, how old I am – or even "who" or "what" I am, is of no slightest importance to anybody but myself, or shouldn't be; and in the matter of my age, I will only say that I am neither seventy-two nor in my twenties – and that should be old enough to realize that it is impossible to redirect the thinking of fools, but am apparently still young enough to be foolish enough to keep trying.

My personal interest in physical training is only one of many interests – which statement, to many people, will be proof that I could not have devoted much real attention to it; but which fact, to intelligent readers, will be proof that I am perhaps not totally biased.

And for the information of people who may have jumped to the incorrect assumption that I am biased against both drugs and dietary considerations, I will mention that I have had quite a lot of experience with both drugs and diet, having for example had extensive experience developing the techniques for "drug captures" of large African animals – I instigated, planned, paid for, directed, and carried out the first (and so far, the only) large-scale capture of African elephants, using the recently developed "capture drugs."

In the way of experience with diet, it should be noted that I was in the business of importing a wide variety of extremely delicate wild animals for many years; many of which animals were thought to be impossible to keep alive in captivity – before I did so.

During the fairly recent elephant capture operation, for example, we met extreme opposition from professional conservationists who insisted that it was literally impossible to keep small African elephants alive in captivity – and they believed that it was impossible, because they had never been able to do so; but, after the fact, after we clearly demonstrated that we could keep even the smallest elephants alive and healthy – and doing so was primarily a matter of diet – then the same "experts" were very quick to claim credit for our success.

Which – people being people, all over the world – was not surprising, but which should at least make it clear that I am aware of the importance of diet factors, and do have experience along that line, experience with diet, experience with drugs, and experience with people.

Nor is my experience so limited: I am holder of United States Airline Transport Pilot's License No. 1042912, and also have a South African Airline Pilot's license – together with more than 17,000 hours of pilot-in-command experience, in everything from intercontinental transport category aircraft to helicopters, experience extending over a span of more than thirty-two years of flying, on every continent except Antarctica, and in practically every country in the world, transporting people, animals, cargo, and bombs. Operating out of international airports and jungle landing-strips.

I am married, have four children – the oldest twenty-five, the youngest fifteen – and I have one grandchild: my youngest daughter is a sophomore in college (pre-med school) at the age of seventeen, and on the honor roll, she plans to be a medical doctor – which will not be out of character in my family since there have been eight other doctors in my family during my lifetime, my father, my mother, my brother, my sister, my paternal grandfather, my uncle, my cousin, and my brother-in-law.

Fifteen years ago, I became involved in motion picture production – and since then I have produced more than three-hundred films for television and or theatrical distribution.

For many years have been very interested in the treatment of poisonous snake bites – and have, I think, done rather well in that direction; having treated more than four hundred serious snake bites without, so far, even as much as the loss of the use of a digit of a finger.

None of the above will be of any slightest interest to most people – and it shouldn't be – but even a full personal history would not be enough for some other people, who will, I am afraid, just have to remain unsatisfied in their curiosity; but I will point out for the benefit of everybody that "who" I am or "what" I am is of no concern – my ideas are either valid

or they are not valid, and the validity of ideas is not dependent upon personalities. While it may be perfectly natural to believe something that is stated by a person whom you respect – it is frequently true that you will later regret having done so; and, of course, it is lots easier to respect people who put forth ideas that agree with our own preconceptions – another common mistake.

Back on the subject of diet briefly; even now, we are working on the factor – and, eventually, when we are ready, and when we are very sure of our ground, we will have more to say on the subject. And don't forget what I said in an earlier article, "…we haven't dropped our heavy ammunition yet."

And, regarding my comments in an earlier article about the stupidity of using an "easy curl" bar, and-or a "Scott curling bench," do you really think that you can run faster without using your legs? Well, that is not too far out of line with what you are trying to do when you use an "easy curl" bar – since you are trying to increase your curling strength while forcing the arms into a position where it is literally IMPOSSIBLE for all of the biceps muscles to function.

Think back – can you reverse curl as much as you can regular curl? Certainly not. But why not? Because, in the palms-down, pronated, position used in a reverse curl the biceps are forced into a position where they cannot function fully. And "easy curl" bar does not quite go that far in that direction – but it goes at least part of the way, much too far to permit the biceps to function best.

The Scott curling bench? Well in that case you are removing resistance near the contracted position of a normal curling movement and replacing it with resistance near the starting (extended) position; a very poor swap, one that can only reduce the production of results rather than increase it. In a curl, you need the resistance as close as possible to the position of full contraction of the biceps; and while the use of a Scott curling bench certainly "moves the resistance," it just as certainly moves it in the wrong direction.

And for the benefit of any readers who feel that they really are training "hard" – or who feel that our trainees are not training a lot harder – I will make the following observation: I have been known to make wagers, for money – so come down to Deland and run through a workout with some of our football players, and bring your money and your "sick bag" with you. If you are foolish enough to bet, you'll need the money to pay off with – and if you try to follow our trainees through a workout, you'll need the sick bag, whether you bet or not.