

Ironman Articles

1970-1974

The Time Factor in Exercise

As a factor in exercise, time is of great importance – for several reasons, and in a number of ways; running a “three-minute mile” would correctly be looked upon as a superhuman performance – and a “six-minute mile” is almost no performance at all. Yet the only difference is the time involved – in all other respects, the performance is equal; the distance covered is the same, the weight moved is the same, and the work performed is exactly equal in both instances.

For the average bodybuilder, “elapsed time” is usually the only time factor of any importance; “...how many years will it take me to reach my bodybuilding goals?” seems to be the only question in the mind of the typical weight-trainee – the only question on the subject of time, at least. Total training time – the actual number of hours devoted to training is of little or no importance to most bodybuilders; many of whom seem to be perfectly willing to devote twenty, or thirty, or even forty hours of weekly training to their workouts – if they are encouraged to believe that such marathon training programs will speed their rate-of-progress, reduce their elapsed training time.

A football coach using weight-training as supplemental exercise for his team is also concerned with elapsed time – but even more concerned with actual training time; or at least he should be, since available training time is always a critical factor.

But “elapsed training time” and “actual training time” are not the only time factors involved; additionally, we must consider such matters as “speed of movement,” which obviously depends upon the time required for the performance of a single repetition – and “pace of training,” which is determined by the rest periods between sets – and “number of repetitions,” which affect the time required for performing one set of an exercise – and “number of sets,” which will to a large degree determine the total length of workouts.

Also, for the purposes of charting progress, it is obviously necessary to consider at least two of the above-listed time factors, “elapsed training time,” and “total training time.” Paradoxically, and quite in contrast with the widespread belief, increasing total training time usually WILL NOT REDUCE elapsed training time – “doing MORE, in order to reach the same goal QUICKER,” almost always has a result exactly opposite to that desired.

Twenty-seven years ago, just after a rather prolonged unpleasantness called the Second World War, which occupied my attention for four years and prevented me from devoting much of my time to weight-training, I was perfectly willing to devote almost any amount of time to my workouts; for a while I trained as much as twenty-eight hours weekly, four times daily, seven days a week – and FOR A WHILE, I made gains, UP TO A CERTAIN POINT. Beyond that point, I simply couldn't go.

A bit later – after having, in the meantime, tried almost everything – I settled on a program of twelve hours of weekly training, three workouts of four hours each; then I made additional gains, progress that I previously considered impossible was produced very rapidly – but gain, ONLY TO A POINT, a point that I considered far below my potential.

Then, literally by accident, I was forced to reduce my weekly training time by exactly fifty percent – and the first week of such reduced training produced more progress than I had experienced during the immediately preceding three months.

Eventually I settled on a program of four hours of weekly training – three workouts of one-hour and twenty minutes each; during the first seven weeks of such training, I gained twenty pounds of bodyweight while greatly increasing my existing degree of muscularity (a “net muscular-mass gain” of at least twenty-five pounds), added two-and-a-half inches to the “cold” measurement of my upper arms, increased by bench press strength for ten repetitions by 70 pounds, and made other gains in proportion – IN EXACTLY SEVEN WEEKS, FROM ONLY TWENTY WORKOUTS. Using only conventional equipment – and a very limited variety of equipment, at that; my program consisted of only eight exercises – two sets of each, squats, standing presses, chins, parallel dips, behind-neck chins, bench presses, barbell curls, triceps curls, a total of only sixteen sets.

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Having been an “extremist” all my life, I always worked out to my absolute limit, so “maximum-possible intensity-of-effort” was an existing factor right from the start; but it took me several years to learn that there is a very definite limit to the “amount” of exercise that will produce good results – carried beyond a certain point (insofar as “amount” is concerned), exercise will reverse its own previous results, producing losses rather than gains. In practice, most bodybuilders soon fall into a rut of training wherein the amount of exercise closely approaches their tolerance for exercise; in such cases gains are impossible in many cases, and very slow in all cases – since the system is constantly exhausted in never-ending attempts to repair the damage being done, and no reserve is left for building additional muscular size.

And make no slightest mistake about the following point – “eating more IS NOT THE ANSWER, regardless of WHAT YOU EAT.” Amount of exercise has LITTLE OR NOTHING to do with protein requirements – but it does increase carbohydrate requirements in direct proportion to the increase in amount of exercise. If you WORK MORE, then you must EAT MORE; more carbohydrates – protein requirements are almost entirely dependent upon existing bodyweight.

And while it is perfectly true that you can increase your “recovery ability” – which, in effect, will give you a greater tolerance for exercise, it remains equally true that limits will always exist, IN ALL CASES; and if you exceed those limits, losses in muscular size will be produced instead of gains – and if you work exactly at the level of your individual limits, as many bodybuilders do for years, then no gains will ever be produced – and if you work just below your limits, as many thousands of other bodybuilders do, then gains will be very slow.

BUT IT MUST BE CLEARLY UNDERSTOOD – such limits apply only to the “amount” of exercise; it is literally impossible to work “too hard.” And since most people always seem to feel that generalities apply only to somebody else (never to themselves), it should also be clearly understood that rather definite limits to the worthwhile “amount” of exercise are already plainly understood; these limits define the “upper” and “lower” levels of the amount of exercise that will produce good results in ALL CASES – if exercise in excess of the amount indicated produces results considered worthwhile by an individual (by ANY individual), then this is merely proof that simply spectacular results would have been introduced by that individual, IF THE AMOUNT OF EXERCISE HAD NOT EXCEEDED THE LIMITS. In these apparently exceptional cases, the individuals involved possess far greater than average potential and/or recovery ability – which is certainly no excuse for poor utilization of any such existing advantages; or it could be that individual opinion is in error – subnormal results may be viewed as good results by people who are not aware of the rate-of-progress to be expected from proper training.

I have yet to meet a rational man who would even consider trying to walk from one place to another on a treadmill – yet literally millions of trainees attempt to produce muscular size increases in an almost identical manner. If progress is not constant – and rather fast, fast enough to be apparent – then something is wrong; but in order to be sure that something is wrong, at least a fair understanding of the time factor (or factors) in exercise must be reached – and such knowledge must be applied to a rational progress-charting program based on measurable strength-increases. Without such knowledge, or without proper application of the required knowledge, then attempting to estimate the value of a particular training program is impossible – in almost all cases being outright guesswork; but in practice, such accurate progress-charting is actually quite simple – and if the information required for such charting is clearly understood, then an actual understanding of the theory involved IS NOT REQUIRED.

But – therein exists a problem; most of the people who really need this information are unwilling to accept it without a clear explanation, and they are literally incapable of understanding such an explanation – lacking the necessary background in physiology, such people cannot comprehend a technical explanation and even a reasonable attempt to explain the involved factors in non-technical terms would run to a length far in excess of the attention span of almost everybody.

Secondly, most currently-active trainees have been exposed to such a mass of outright hogwash masquerading as “fact” that becomes firmly-held (and totally-false) beliefs.

Taking advantage of this fact that most people are naturally lazy, quite a number of other people with little or no interest in anything except money – and with no slightest regard for the truth – have devoted years of their time and millions of dollars of windfall profits to efforts of brainwash the general public on the subject of exercise; and let it be clearly

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understood that I am NOT talking about the “anti-exercise” forces, who are very quick to devote their remarks, but seldom if ever their money, in a manner intended to raise doubts on the subject of exercise; while frequently doing great harm, such people are at least sincere – even if, as happens to be the case, sincerely mistaken. Rather, I am concerned here with the people who should know better – and frequently do know better – people who, while claiming to be the strongest supporters of the entire field of physical training, are in fact its worst enemies; these people are sincere only in their desire to make money – any way they can, regardless of the results to others. As an unavoidable consequence, a situation has existed for many years where the actually-informed people have been largely ignored – while the “anti-exercise” forces have been given at least some attention (while deserving NONE), and while the supposedly “pro-exercise” voices have been those of commercial interest.

Under the circumstances, it is hardly surprising that the situation has finally degenerated to a point where sincerely interested people are the most-poorly informed.

With the physical-training media having been dominated by commercial interests for the last thirty years, we have eventually reached a point where even self-evident truth is ignored, and where outright lies are published as scientific fact.

You think otherwise? Then just look around at the great number of supposed “spot reducing” methods being touted at the moment; “spot reduction” of fat is an outright myth, a physical impossibility – the body is a single unit, it stores fat as a unit and it loses fat as a unit, if you are fat anywhere then you are fat everywhere.

Yet millions of bodybuilders – the very people who should know better – have performed billions of situps and leg-raises in totally wasted efforts to reduce fat from the mid-section while maintaining all of their existing size elsewhere; such abdominal exercises will burn off fat – but only in direct proportion to the “amount” of work performed, and an exactly equal amount of work performed by any muscular structure of the body would have produced exactly equal results.

Certain sections of the body – the abdominal area, the hips, the upper thighs – appear to become fat more readily than other areas, and it is only natural to assume that exercise for those areas is the answer to such a problem; but the stinger in that statement is the fact that the first part is PERFECTLY true – that is, “certain sections APPEAR to become fat more readily,” and appearances are frequently deceiving. But it is equally true that the hump on the CAMEL’S BACK “appears” to become fat more readily than other parts of the body.

And it is also true that the existence of visible fat stores on the surface of a man’s abdominal area – or on a camel’s hump – is simply evidence of the fact that less-obvious fat stores are located throughout the body; it is merely a matter of degree – ANY fat there indicates SOME fat everywhere.

And in many cases, appearances are deceiving in another respect; an area with very poor muscle-tone may appear to be fat when actually very little surplus fat exists – the soft, “dimpled” look so common on the surface of women’s upper thighs is primarily a result of poor muscle-tone, rather than evidence of surplus subcutaneous fat. Exercise performed for that section of the body can rather easily restore muscle tone and thus give the impression that fat has been removed. Thus very brief exercise may appear to remove a rather large amount of fat.

Also – speaking of “removing” fat, as I have done above, is in itself an error; recent evidence shows that fat, once formed, cannot be removed except by surgery – apparently fat cells, once formed, can only be “reduced in size,” but can NOT be removed by exercise or diet. And unlike muscle fibers, which cannot be increased in number (exercise increases the SIZE of muscle fibers, not the NUMBER of fibers), fat cells can be increased both in size and number – but can only be decreased in size by exercise and diet. Which perhaps helps to explain why it is so much easier to get fat the second time around – but which is certainly not an excuse for anyone to remain visibly fat.

Decreases in the “amount” of fat (decreases in the SIZE of fat cells) can be brought about in only one way – by changing the input-output ratio of food consumed and energy expended; if you are using more energy than you are replacing with your diet, then the system will be forced to use bodyfat as a source of the required energy that is not being provided by the diet, and you will then reduce the size of some existing fat cells.

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Some people can lose fat easier than others – but the above-outlined rule holds true in ALL CASES, it is merely a matter of degree; however, the age factor changes things in some ways – other recent evidence has clearly shown that the addition of fat to certain areas of the body is an almost unavoidable result of age in many cases. In my own particular case, I don't think I could have added visible fat to my body if I had tried – before the age of thirty; but after the age of forty, I found it almost impossible to remove visible fat –having once weighed 205 at a height of a bit less than 5 feet 8, with no slightest traces of visible fat. I later found it impossible to maintain an equal degree of muscularity above a bodyweight of 160.

Some individuals find it impossible to get fat at any age – a few people find it nearly impossible to keep from getting fat at almost any bodyweight; but all such cases are simply examples of perfectly normal variation within a certain scale – they are not exceptions to the rule.

In practice – because of such normal variation – this means that each individual is just that, an INDIVIDUAL; an amount of food that might be too much for him could easily be too little for another individual. But the rule still holds true; if you are adding fat, then you are eating too much – and if you are losing fat, then your diet is not fully replacing your output of energy. Secondly, HOW you use the energy is of no slightest importance – the results will be the same if you burn 1,000 calories by doing squats or by doing situps; insofar as “fat loss” is concerned, at least.

The above remarks on the subject of fat loss are not “opinion” – neither my personal opinion nor the opinion of somebody else – they are simple statements of clearly established, undeniably proven, fully supported FACTS; and while anybody is free to form an opinion on any subject – contrary opinions in this case are simply proof of ignorance, or deceit.

Deceit? Yes, or fraud; call it what you like – if a man attempts to refute the above statements on fat loss, and if he isn't simply ignorant, then he is a prevaricator, probably for his own commercial gain.

The whole field of weight training is almost literally knee deep in such frauds at this very moment; so it isn't at all surprising that millions of trainees are a bit confused – having been exposed to thousands of outright lies and having the truth carefully hidden. But such a result is not entirely due to the efforts of people touting such frauds – to a large extent, the victims of such frauds are at least equally guilty; since the victims are almost always people looking for “easy” solutions to hard problems – such people are constantly seeking miracles, are always willing to try something “new” just on the off-chance that it might work.

I cannot redirect the thinking of such people – and I suppose it is merely proof of my own foolishness that I even try; but I don't have to remain silent in the face of widespread outrage, either – and I won't.

“Don't rock the boat,” a well-meaning friend told me recently, “you have nothing to gain and you'll just make a lot of enemies.”

Maybe so – but I've had enemies before and I'll have them in the future, no matter what I do or say. And if I restricted my remarks – or my activities – to situations that were obviously to my financial advantage, I'm afraid I might end up with an attitude like that of the people who are perpetrating the frauds alluded to above; so, thanks, but no thanks.

And just what does all of this have to do with the “time factor” in exercise? Quite a lot – far too much; the proper understanding of the time factor (or factors) in exercise unavoidably leads to answers that are not often very welcome, and never welcome to people seeking “easy” solutions.

For reasons that are far too complex to go into here, it is now obvious that a fast pace of training is an absolute requirement for producing maximum-possible results – similar results can NOT be duplicated in any other known manner, and make not the slightest mistake about another point – there are no “secrets” in physical training. Some people know what they are talking about and some people don't; some people are freely willing to admit the truth and some aren't; it's really just that simple.

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When the full truth (full in light of presently existing knowledge) is known, then certain conclusions are unavoidable – but unfortunately, most interested parties don't have the availability of all the required information, and most of them wouldn't understand a large part of it if it was available to them; but, worse still, a lot of them wouldn't admit the validity of important portions of the information even if they did understand it – so long as something appears to support preconceived notions, most people will accept it, but when it tends to refute their preconceptions, the same people will try to deny it.

Thus – as I write these words I am clearly aware that most readers will accept part of it and reject part of it; basing their opinions primarily upon the degree to which my statements tend to support their own individual preconceptions.

Paradoxically, if I was attempting to tout some “easy” (but totally worthless) method or style of training, then practically everybody would instantly accept it – primarily because they would want to; people just naturally tend to welcome pleasant ideas and easy solutions – and just as naturally tend to avoid the opposite. And it isn't merely a matter of lack of knowledge; most people are clearly aware that “saving money” is a good idea – but how many people do you know that have actually saved any?

If you were walking through the desert with a pick and shovel in your hands, and if you came upon an old man digging a hole in the rocky ground with his bare hands, and if he showed you a small hole and pointed to it as a great accomplishment for forty years of his unending toil, and if you then demonstrated the use of your pick and shovel – instruments that were totally new to the old man – you would probably expect him to look upon you as a savior, but in fact, he would probably beat you to death with your own pick and shovel –and if not, and if you did escape and returned twenty years later, you could reasonably expect to find him still there, still digging with his finger nails, while the pick and shovel rusted away, in plain sight but unused. Such is human nature – sobeit.

So I come along, and I tell people that four hours of weekly exercise will do more good in six months than twenty hours of weekly training will do in two years – and it will – and some people listen long enough to be at least tempted, so they try it, and it works, and they can hardly believe it even then; but many people (especially the people who have been training for twenty years, and thus “know everything”) don't even listen – they can't believe it, they don't dare believe it, primarily, I think, because in order to do so they would then be required to admit (even if only to themselves) that most of their own previous efforts were wasted, and most people simply can't bring themselves to admit something so damaging to their ego.

So, twenty years from now, you will still see many examples of people training four or five hours a day, seven days a week – spinning their wheels in the sands of time, trying to go cross-country on a treadmill and calling themselves “experts”. But you will also see examples of people training two or three hours a week, and producing more results in six months than the other people do in a lifetime.

But in the meantime, here we sit in “Neverneverland” – where most people never hear the truth, many people would never admit the truth even if it hit them across the face like a used catfish, which might be funny – if it wasn't so sad.

So just how do you get across to people in a world like this? Well, by and large, you don't – not if you're telling the truth, but lies – that's an entirely different matter; most people are perfectly willing to believe lies, especially if they're pleasant lies. Years ago I remarked that people seem to be successful in inverse ratio to their honesty – the totally phony people are generally the most successful, the fairly phony people are reasonably successful, and the honest people usually fail or struggle for years with little or no recognition or reward for their efforts.

Sour grapes hopefully intended to explain my own failure? Well, think what you like – but at the moment we have eight plants making Nautilus machines as fast as possible and we still have all we can possibly do to keep up with a steadily and rapidly increasing flood of orders. But doesn't that result disprove my above statement about success being increased by lies – or prove my own dishonesty? No –that result neither disproves the validity of the rule nor proves me phony, because, in this case, quite a bit of the success of the machines is based on other peoples' phony aspirations – impossible dreams, hoped-for miracles, desperate desires, the apparently never-ending search for the Golden Fleece. The same sort of thinking (?) that has led to the present widespread use of drugs, the same blind willingness to accept that has made rich men out of scoundrels, the same desperate grasping at straws that inevitably conceals the truth in any situation where reason gives way to emotion.

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So apparently you can't win – not, at least, if you have any slightest interest in trying to get the truth across; some people reject the truth because it runs counter to their personal bias, and others accept it out of simple desperation, even though they don't understand it, or even really believe it, they simply “want to believe it” – and a few do try to understand, do care about the truth, do try to base their judgements on fact. It is for these “few” that my articles have been written – quite a few, as it turns out, far more than I expected.

But, paradoxically again, those few are actually the hardest to get across to; the “biased against” won't listen, the “biased for” would believe anything – so what I say makes no real difference in either case – but the “rational few” do listen, and won't believe obvious hogwash, and do try to understand, and won't accept unless they understand. All of which is well and good, and as it should be – but with a stinger; the stinger in this case being the fact that even the “rational few” seldom have the educational background required for understanding an actually meaningful explanation.

If I was foolish enough and dishonest enough to be seriously interested in trying to gain the acceptance of the “biased against,” then doing so would be quite simple; all that would be required is “telling them what they want to hear” – since almost all such people sincerely believe that at least twenty hours of weekly training are an absolute requirement for producing worthwhile progress, and since the fact is that such an amount of training will literally make actually good progress impossible, it naturally follows that such people have no slightest idea of what good progress really is; their firm (and mistaken) beliefs having prevented them from ever experiencing good progress, so all that would be required to gain the acceptance of most such people would be a statement to the effect that proper use of the Nautilus machines requires at least THIRTY hours of weekly training and that such training would produce a ten or fifteen percent improvement over the use of barbells.

And, of course, the “biased for” would accept that too – since they will believe anything.

But unfortunately, the truth is that thirty hours of PROPER USE of the Nautilus machines in any one week would kill a bronze statue – and that amount of proper use would produce losses instead of gains.

But since anything will serve for the “biased for” and I sincerely don't care what the “biased against” think, and since I do care about the truth, I don't have it quite that easy; so all I can do is point out facts, make a stab in the direction of a simple explanation, and hope for the best.

Were you aware, for example, that a reduced level of work for a muscle that has been previously exhausted by much heavier work will cause that muscle to recover more rapidly? And do you understand the significance that this has in all forms of exercise?

And while I will NOT make even an attempt at an explanation regarding “why” this is true, I will give an example to clearly prove the truth of that statement; try running at top speed until you are ready to drop – and then suddenly stop and rest. Next, try the same thing – with one slight difference this time DON'T STOP SUDDENLY; instead, slow down to a jog, and finally a walk, and continue moving for some distance and then rest. Then compare the results insofar as total recovery time is concerned. In the first example, the results may well be crippling – but by using the second method, much faster and more complete recovery can be produced. Why do you think they walk a horse after a race?

This information can be applied to weight training in several very productive ways; since working the triceps muscle also involves a far lighter form of work for the opposing muscle, the biceps, you can produce faster and better recovery by working your upper arm muscles alternately – the slight amount of work provided by the biceps by working the triceps will cause the biceps to recover better than it would if it was rested entirely, and vice versa. Thus – by working the triceps heavily during the rest period between heavy sets for the biceps, you will perform better during second sets for the biceps than you would if you did nothing between the two sets for the biceps.

Thus far better results are produced by working faster – rest periods actually have an effect exactly opposite to that which might be expected in this case; instead of doing two sets for the biceps and then two sets for the triceps with rest periods between sets, do the sets alternately with no rest at all – far better results will be produced in much less time. But again, it is results we are after – the saving in time is merely a welcome “side benefit,” not the goal we are seeking.

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And the same system can be applied even if you are using the “pre-exhaustion” principle – in that case you merely alternate cycles; first perform a set of barbell curls immediately followed by a set of triceps curls immediately followed by a set of parallel dips, then a second “biceps cycle” (another set of curls and immediately-following pulldowns), etc.

Two such cycles for the biceps and two such cycles for the triceps – performed alternately with no rest at all – will do more for your arms than any amount of the same exercises performed in any other manner; will work your arms “harder” than you can with any number of sets, and you will do so without overworking them – will stimulate growth without making growth impossible from overwork.

But such a style of working certainly isn’t “easy” – it is brutally hard; so hard that you will probably vomit halfway through an eight minute arm workout the first time you try it – and you WILL VOMIT the first time you try it if you do it right. And as all regular readers should know by this point, doing it “right” means performing each set of every exercise to a point of absolute failure, where no slightest amount of additional movement is possible.

Using conventional equipment, a properly outlined and correctly performed workout for the entire arms – biceps, triceps, and forearms – should require less than thirty minutes, three times weekly; a total of an hour and a half of weekly training for the arms will invariably result in overtraining – better results would have been produced by less training, IN ALL CASES.

Regarding the above outlined arm routine – and in very simple terms – the involved factors are as follows: proper utilization of the “pre-exhaustion” principle requires going from one exercise for the biceps (or any other muscle) to an immediately-following exercise for the same muscle, and in this case the time factor is very critical; it is literally impossible to move from one exercise to the next too quickly; an ideal situation would require ZERO rest between the last repetitions of the next exercise, which of course is impossible – but do move from one exercise to the next as fast as you can. In this case, such fast movement from one set to the next is the very basis of the whole thing – without which the whole idea is lost; you are “pre-exhausting” the muscle with the first exercise and then forcing the same muscle to work far beyond a point of normal failure by immediately involving it in a compound exercise where other muscles lend enough assistance to permit continued function. But the recovery time of an exhausted muscle is so rapid – something on the order of fifty percent within the first three seconds – that much of a delay between sets will make best utilization of this principle impossible.

Secondly, after the completion of the second set for the biceps (or other muscle), it is then desirable to produce the fastest-possible rate of recovery – in order to be able to perform at a maximum level when it is time for the next biceps exercises; so a rapid pace of training is again required – but now for an almost opposite reason. In the first instance, you were moving on from one exercise to the next as rapidly as possible in order to start the second set before the muscle could recover – and in the second instance, you were moving to a triceps exercise quickly in order to cause a more rapid rate of recovery in the biceps.

Using Nautilus equipment, we have now found that the best possible results for the arms can be produced by a total of exactly twenty-two minutes of weekly training – three weekly workouts of seven minutes and twenty seconds each; and I want it clearly understood that this is the routine used by extremely advanced trainees, not by beginners – Casey Viator added an inch and a quarter to the “cold” measurement of his upper arms within a period of less than four months on this exact program, while increasing his definition and with resulting great improvement in strength. And his arms were literally enormous when he started on the program – and as you should know, the larger you get, the harder it becomes to add even more size.

But critical time factors in exercise are not restricted to the actual workouts – rest periods between workouts are time factors as well, and are fully as important as other time factors.

If muscles are worked as hard as they should be for best results, then a rest period of at least forty-eight hours is required between workouts – and while it might appear that this requirement is invalid if the previously-mentioned requirements for a low level of work during rest periods is properly understood, no such conflict actually exists; the “low level of work during rest periods” requirement applies only on a very short-range basis, it helps speed recovery time between sets – but would be counter-indicated between workouts.

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However, even that is subject to misunderstanding; this does not mean that literally “nothing” should be done between workouts – it simply means that workouts should be separated by at least forty-eight hours, during which time normal activities should be continued, **BUT NO TRAINING**.

Also, at least one rest period of seventy-two hours should occur during each week of training – thus, in practice, we find that the old three-times weekly training schedule is very close to being ideal; and in some cases involving “hard gainers,” two weekly workouts will give even better results.

And now we come to the time factor of “speed of movement” – which may well be the most difficult one to correctly explain, and certainly is the most difficult to justify in simple terms; in general, speed of movement should be as fast as possible in line with safety considerations – which simply means that you should perform each repetition at the greatest possible speed **WITHOUT JERKING** and without “cheating” during the first several repetitions. I will use a set of barbell curls as an example of proper speed of movement: the first repetition should be performed in a perfectly strict style, with no slightest amount of “cheat” and at a speed a bit slower than the speed that would be possible at the moment – if you perform the first repetition “as rapidly as possible” then you will unavoidably produce some degree of jerking. The second and third repetitions should be performed in a similar fashion, but by the time you reach the fourth and fifth repetition, you should then be able to move as rapidly as possible without involving any jerking – by that point in the set, even though you are then moving the barbell as fast as possible, actual movement should be quite slow. At least seven repetitions should be performed without “cheating” – but then, in order to continue, some cheating should be required; but **DO NOT** cheat to make the last few repetitions “easy” – cheat only enough to make them **POSSIBLE**. If the set is properly performed, then these last few repetitions should be brutally hard, and should move **VERY SLOWLY** in spite of the cheating involved – if the barbell rapidly “swings” to the top position, then you are accomplishing nothing. The last repetition should take about **THREE SECONDS** – which is a very long time for one repetition; the bar should literally creep throughout the last sixty or seventy degrees of movement.

If the cheated repetitions are done incorrectly, then you can continue with them almost endlessly – but if they are performed properly, then only two or three such repetitions are all you need, and **ALL YOU CAN STAND**.

A word of caution: if you perform heavy barbell curls – as you should – and if you rest the bar on a bench between sets, then be **EXTREMELY CAREFUL** about **HOW YOU PUT THE BAR DOWN**. If you drop the bar onto the bench, even from a height of an inch, a shock will run up your arms and into your spine with such force that it is literally possible to break your back in this manner, so – if you do drop the bar onto the bench – then be sure that your hands are entirely clear of the bar before it hits. And if you maintain your grip on the bar while replacing it on the bench, then don’t drop the bar at all – handle it as if you were putting it down on an egg while trying to keep from breaking the egg.

Also, pause very briefly at the bottom and at the top of each repetition, and relax as much as possible under the circumstances, in order to momentarily relieve the forces which will be enormously elevating your blood pressure during a hard muscular contraction. If you don’t, you may find yourself “passing out” in the middle of a hard repetition; one second you will be standing up curling the bar and the next thing you know you will be stretched out on the floor – possibly having dropped the bar on your leg while you were out. When it happens, it happens so fast that you are not even aware of it – one second you are up, the next second you are down. Apparently the size of the involved muscles has nothing to do with it – the responsible factor seems to be “degree of contraction,” thus violently contracting a small muscle will cause a greater rise in blood pressure than would result from a lower order of contraction of a larger muscle, even though actually less muscle mass was involved.

Which is not a surprising result if the involved factors are clearly understood; because, in effect, the human circulatory system is a “closed hydraulic system,” and the mass of applied force is of no importance – only the degree of applied force has any effect insofar as raising the pressure of the system as a whole is concerned.

Thus, while it might be expected that a heavy set of squats would be most likely to cause such “blacking-out” from elevated blood pressure, in fact this almost never happens – because, while the mass of the involved muscle is greatest in squats, the degree of contraction seldom if ever is as great as that experienced in a set of heavy curls. “Amount” of effort is not the responsible factor – instead, “intensity of effort” seems to be the only factor involved.

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In order to reduce the likelihood of such “black-outs” it is not necessary to pause for several seconds at both ends of each repetition – but it is necessary to pause at **BOTH** ends; and effort should be reduced as much as possible during that pause – and if this is done, then only a very brief pause is required, something on the order of half a second, just enough to momentarily relieve the blood pressure and restore normal circulation to the brain.

Proper understanding of – or at least an “awareness” of – the involved time factors in exercise is of extreme importance; unfortunately, such factors cannot be clearly justified in a brief non-technical manner – so you can take the above advice “on faith” or you can ignore it. But if you choose to ignore it, then you are making the biggest mistake of your training career.

But I do think that you should give at least some consideration to the fact that “I don’t care **HOW** you train.” I can’t sell you a proper style of training – and I stand to gain or lose nothing, no matter how you train.