

Nautilus Bulletin #2

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Time Factors in Exercise

Reasonable determinations of rates of progress must be based on two separate time factors, "total training time" and "elapsed training time." Total training time is determined by the total number of hours devoted to training during a certain period of time – elapsed training time is the time period involved, days, weeks, months, or years.

Other related time factors are "actual training time," the time actually devoted to working against resistance – or, in effect, total training time minus resting time that occurs during the workouts; the "pace of training," which is determined by the delay between sets and the speed of movement; and, of course, the "speed of movement" itself.

Final results that appear quite good when measured against only one of the above factors may in fact be quite poor – but most bodybuilders seem to be concerned only with elapsed training time, and are apparently willing to devote almost any amount of total training time to their workouts if they feel that such marathon workouts will reduce the elapsed training time; but in fact, quite the opposite is true – and such long and frequent workouts actually (and enormously) retard progress as measured on any scale.

So – back on the treadmill; running faster and faster and getting nowhere. But even when it is possible to make an individual aware of the real facts, it still remains almost impossible to make all of the involved time factors clear in relation to each other; if, for example, you are finally able to make a particular trainee aware of the requirement for an almost zero time delay (or resting period) between sets of different exercises performed "in cycle" in keeping with the "pre-exhaustion" principle of training, this information is then usually misinterpreted to mean that the exercises themselves should be rushed through – which is of course not at all desirable.

Instead, each set of every exercise should be performed properly – with absolutely no consideration for how much time is involved; and only after one set has been correctly completed, should the "rush factor" be involved – in effect, do each set right, but then move immediately to the next set in the cycle.

Our primary interests have been aimed in the direction of producing maximum-possible progress from each week of training – and within reason, we have been willing to adjust the other time factors to almost any extent in order to improve weekly rates of progress; in effect, we did not care how much total training time was involved – we, like most bodybuilders, were willing to extend the total training time if such an extension would reduce the elapsed training time.

But eventually – even if somewhat to our surprise – it became obvious that it was necessary to reduce total training time in order to reduce elapsed training time; which result, on the face of it, at first seems ridiculous – after all, in how many other situations can you produce faster results by devoting less time to the job? In this instance, faster results meaning "better results" – in every sense of the word better.

But in situations with interrelated physiological and psychological factors, rather strange results are frequently forthcoming – unavoidably plain, if not always clearly understood; for example, during the course of several years devoted to capturing large animals in Africa, we learned that the method of capture which appears to be the least damaging to the animals is actually the most damaging – while another method of capture that we at first avoided because it seemed to be obviously detrimental to the animals, in the end proved to be the best method.

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Capturing animals by running them down in broad daylight with a vehicle would appear to be a very dangerous method of capture – since it obviously involves very strenuous and sometimes long-extended efforts on the part of the animals; while capturing the same animals at night, using the element of surprise, would seem to be the easiest method – and the least damaging to the animals, since such captures can normally be made with no chasing at all. But in fact, quite the opposite is true in both cases.

I have never been able to determine just why the results turn out as they do, but the results themselves are obvious – an animal captured at night with no chasing stands a very good chance of dropping dead shortly afterwards, apparently from shock – while an animal that might appear to have been chased almost literally to death in broad daylight will seldom suffer any bad effects and will usually do quite well in captivity afterwards. There is, of course, a limit to just how much chasing an animal can stand – but within reason, such chasing actually seems to reduce the chance of shock from the capture.

In a similar vein, an animal that is shot by surprise will frequently drop dead from a wound that would not have bothered him much if he had been warned of danger in advance of the shot. While an animal that is aware of danger prior to the shot will sometimes continue frantic efforts with a wound that would seem to make any movement impossible – there are many accurate reports of large animals killing hunters after having their hearts destroyed by heavy bullets.

In such instances, the actually involved factors are far from being clearly understood – while the results are obvious; and in exercise of human muscular structures – particularly when such exercises are compound movements involving several large muscles – somewhat similar results are observed.

In effect, it is obvious that a certain amount of time is required for a muscle to prepare itself for intense exertion – without which preparation, damage may result; secondly, it is also obvious that a muscle so prepared is then capable of working at greater intensity. Most weight-trainees are at least aware that such time factors are involved in strenuous exercise – but very few trainees actually understand the implications; for example, the great number of theories regarding the requirement for "warming up" indicates a total lack of widespread agreement on this subject.

Again, it is not necessary to understand the cause-effect relationships involved – so long as the implications are clear. But when an understanding is possible, it is then sometimes also possible to make practical use of the knowledge in apparently unrelated applications; for example, on the practical level it has long been obvious that a resting muscle recovers more quickly if it is exposed to a workload of low intensity during the resting period between heavy exertions – I say that this has been obvious on the practical level because people have made use of this knowledge in practical ways while really not understanding the cause-effect relationship, and frequently without even knowing that they were making use of this knowledge. Horses are walked after a fast run, and this is practical utilization of the factor under discussion – but few people have ever wondered why this is done.

In body building, so-called "super sets" have been in wide use for a number of years – yet nobody seems to have noticed the actual cause-effect relationship responsible for the good results produced from such a style of training; and being unaware of the real factors involved, other practical applications of the same factors have thus been overlooked by almost all bodybuilders – while a few bodybuilders have made more or less accidentally-proper use of these factors.

Heavy work performed by a muscle results in much-lighter work by the opposing muscular structure – in effect, working the triceps results in a much lower order of work by the biceps, and vice versa. So doing a heavy set of curls for the biceps between two heavy sets of a triceps exercise will actually result in faster and more complete recovery by the triceps than would have been experienced if total rest had been employed instead of the work for the opposing muscles.

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You might, for example, perform a set of triceps extensions to the point of failure with 100 pounds – and during the first set you might reach a point of failure after ten repetitions; then, following a rest period without exercise of any kind, you might be able to perform only eight repetitions during the second set of triceps work with the same resistance. But if, instead of resting between sets for the triceps, you had performed a heavy set of curls for the biceps between the two triceps sets, you might then have been able to get nine or ten repetitions during the second set for the triceps; because the heavy biceps work would have provided a much lower order of triceps work during the period when the triceps muscles were recovering between heavy sets – and this reduced workload for the triceps would have hastened and improved the recovery of the triceps.

A similar result can be produced without using super sets – but with an unavoidable disadvantage; instead of doing biceps work between two sets of triceps work, you could perform a very light set of triceps work between heavy sets for the triceps – but in that case you would be increasing the amount of exercise involved. Whereas, by using super sets, no additional exercise is being added to the workouts.

From the above, it should be obvious that working the biceps one day and the triceps on another day is a very poor style of training – yet such a style of training is very common among bodybuilders.

In a body building magazine dated September, 1958, apparently-first announcement of the so-called "Inter-set Relaxation Principle" was made; a long article under the byline of the publisher of the magazine made extravagant claims regarding the supposed value of this "discovery – and urged readers to later remember where they first read about the new training style advocated. Or the new "resting style," since the article dealt with the time periods between sets of an exercise.

This article urges "more than total rest" between sets – instead of merely resting in the usual manner, the reader was advised to relax "totally," whatever that means; and the statement was made that this new principle was the "ultimate" step toward achieving the perfect human body.

In the same article, the author also claimed credit for other supposedly revolutionary training principles – and listed among others the "Flushing Method" the "Muscle Cramping Method," and "The Mental Contraction Method," all of which, from their very names, were obviously intended to produce results almost exactly opposite from the results being sought by users of the Inter-set Relaxation Principle. So the readers are simultaneously being urged to do everything possible to prevent muscle-recovery and to hasten and improve muscle-recovery.

And as should be obvious if the previously mentioned result produced by a lower order of work between heavy sets of exercise is clearly understood, total relaxation immediately following heavy work – or between heavy sets of exercise – is certainly NOT the way to hasten or improve muscle-recovery.

It was suggested in the same article that trainees – by making use of this "new principle" – could thus manage to squeeze even more exercises, or more sets, into their workouts; the obvious implication being that the "amount" of exercise is the most-important factor – when in fact, a large amount of exercise will literally prevent muscular size and strength increases. All of the evidence clearly supports the contention that the "intensity of exercise" should be as high as possible – and that the "amount of exercise" should be limited to the absolute minimum that will produce the desired growth stimulation. If one set of one repetition of one exercise would produce maximum-possible growth stimulation – which, unfortunately, it will not – then that would be the ideal amount of exercise.

The truth of the matter is that weight-training publications ran out of anything significant to say over twenty years ago – and having said the same things in a thousand different ways, the publishers of such periodicals are understandably quick to give attention to almost anything that might be considered new or original; but originality is no proof of validity.

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The publisher of one such group of magazines has gone to great lengths in his efforts to prove that the "science of body building" has made great strides during the last few years – primarily as a result of his personal efforts, of course; but the obvious fact remains that this same period of time has actually produced a decline in the average degree of results produced by weight-trainees.

The average weight of a group of 100 men selected at random might be 160 pounds – but within that group you could probably expect to find one individual weighing 190 pounds, and another weighing 130 pounds.

And if the group was extended to 1,000 men selected at random, the average weight would still be 160 pounds – but now you would have ten individuals weighing 190 pounds (instead of only one) and one individual weighing 210 pounds. Likewise, there would be more below-average individuals, and probably at least one individual that was far below average.

And if the group was extended to 10,000 men selected at random, the average would remain the same 160 pounds – with a hundred men weighing 190 pounds, ten men weighing 210 pounds, and one man weighing 230 pounds.

And so on – as the sample increases in size, the "peaks" and the "valleys" will move farther away from the average, but the average will remain the same.

The last twenty years have resulted in an enormous increase in the number of individuals involved in weight-training activities – so it is only to be expected that the actual size of a few outstanding individuals would be greater now than it was twenty years ago; but this is certainly no proof that the overall results produced by weight-training are better now than they were previously.

Such proof of an improvement in method, or tools, or the systems of employing the available tools must come from – CAN ONLY COME FROM – a rise in the average production of results; and this has certainly not occurred in weight-training circles – on the contrary, there has been a distinct decline in the average production of results during the last twenty years.

Most of the decline, I feel, has been a direct result of commercially biased advertising – trainees have been led to believe that they can "buy success," that they can eat their way to great muscular size, or find strength in a bottle. Weight-trainees, being only human, have been quick to believe what they wanted to believe, to listen to what they wanted to hear – if there really was such an "easy" road to the top, they were more than willing to follow it.

Most people will take the apparently "easy" way out in any situation, and for that very reason truly outstanding individuals are rare in any field; this apparently basic "law" of human behavior has certainly not been set aside in favor of bodybuilders – who by and large, if anything, seem to be even quicker than average to grasp at straws in search of "easy" solutions to their problems.

At least a practical knowledge of the relative time factors will probably result if careful attention is given to later chapters dealing with the correct style of performance of exercises; but I repeat, do not fall into the common habit of rushing through the exercises themselves – when the "rush factor" is involved, it is applicable ONLY between sets.