Nautilus Bulletin #2

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The Recovery Factor

When a muscle has been worked to a point of momentary failure by heavy exercise, the situation is just that – the muscle has "failed MOMENTARILY." But in most cases, within three seconds – or less – the muscle has recovered approximately fifty per cent of the strength which it had lost as a result of the exercise; but it does not follow that it will then be fully recovered in six seconds, or even six minutes – full recovery usually takes MORE THAN twenty-four hours, frequently as much as forty to sixty hours. But even if the muscle itself does recover entirely, this is no indication that the system – which supplies the muscle – is fully recovered.

In order to produce increases in muscular size and strength, the muscles must be induced to make certain (but largely unknown) demands upon the system as a whole – demands for the materials required for growth; but growth cannot result even then if the system is unable to supply the needed materials – and do NOT misread this to mean that this is simply a matter of assuring that the right food has been eaten. Far from it; the primary limiting factor in this case is the ability of the system to make the required physiological (apparently largely chemical) changes within the allotted period of time – and if another workout occurs before these processes are complete, then little or nothing in the way of growth can occur.

In effect, it takes hard work to induce growth – and time to permit growth.

There will be individual variation, of course – but only within the limits of a certain rather limited scale; and it is also true that the recovery ability of a well-trained individual will be better than it was before he started training – but again, only to a certain degree. And, please note, I said "well-trained", not "LONG TRAINED"; in fact, many long-experienced bodybuilders have very poor recovery ability – having overworked their systems for months or years they have far less recovery ability than the proverbial "90 pound weakling".

Within the human system as a whole there exist a number of regulatory sub-systems, whose functions are obvious – even if almost entirely unknown; some of these are fairly well understood, some are the subject of heated controversy at the moment, and some remain entirely mysterious – the only people who even claim to understand all of these factors are people like the self-proclaimed "nutritional expert" who dropped dead recently on a television show, moments after proclaiming that he would live to be at least a hundred years old "unless killed by a sugar-crazed taxicab driver". He was seventy years old when he died.

While it should be obvious from a reading of previous chapters that I am certainly making little or no attempt to avoid controversial subjects, it should be equally obvious to intelligent readers that an attempt to explore all of the seriously-proposed theories on the subject of the human recovery factor would be far beyond the scope of a bulletin of this nature; but in fact, such an in-depth examination is not even required for our purposes here – if we are at least aware of the existence of these factors, and able to make practical use of this awareness. After all, just how many people know "exactly what happens" when they turn the ignition switch and activate the starter of their automobile?

When anything is in limited supply, then it is simply common-sense practice to make the best-possible utilization of the quantity that is available –and when you are not sure just how much is available, it is equally good practice to use as little as necessary; in the field of exercise, the implication is clear – use your limited recovery ability as wisely as possible, and as little as possible in line with the actual requirements for producing the results you are after.

It really doesn't matter just "why" intense exertion is required to induce muscular growth, or exactly "how" this is brought about – and it is equally unimportant that we understand the actual reasons responsible for the limitations in our recovery ability; but it is necessary to know that hard work is required, and that recovery ability is limited. A failure to understand – or even be aware of – these factors has led to the presently-existing situation in body building circles, where almost all trainees work far too much and very few trainees work hard enough. Rather than constantly trying to increase the length of workouts, ALL trainees would be well advised to attempt to reduce their training to an absolute minimum. It is my personal belief at this point in time that we will eventually – and rather soon – replace the requirement for training to about one and one-half hours weekly; and I mean the requirement for an advanced bodybuilder who is training for world-class physique competition –and I also mean that any more training would actually reduce the production of results.

Part of this requirement for sharply-reduced weekly training time will not be produced by the use of "cycle training" – but it should be clearly understood that we are NOT using cycle training merely in an attempt to save training time; we are using it because it is an absolute requirement for producing best-possible degrees of results – and it is a requirement because of the extremely short initial recovery time-factors encountered in muscular activity. In order to work a particular muscle as hard as it must be worked to induce maximum growth stimulation – while staying within the limits imposed by the overall recovery ability of the system – you must use cycle training. And when this is done properly, then only one or two such very brief cycles are all that are required – or even desirable; doing more cycles may or may not induce more growth stimulation – but even if so, it would exhaust the recovery ability of the system to a point where growth would be impossible in many cases and very slow in all cases.

At the moment, we are producing extremely good results from the following training schedule for the arms . . .

1. One set of 10 repetitions, standing curl with barbell
2. One set of 12 repetitions, Nautilus Triceps Machine
3. One set of 12 repetitions, Nautilus Curling Machine
4. One set of 15 repetitions, wrist-curls with a barbell
5. One set of 15 repetitions, reverse barbell wrist-curls

That completes one cycle, and up to this point in the schedule there is no requirement for the "rush factor" – performed at the proper pace and with a brief pause between sets, the above five exercises should require about four minutes to perform; although little or no harm would result if as much as ten minutes was used.

6. One set of 12 repetitions, Nautilus Triceps Machine
7. RUSH – One set of parallel dips, maximum-possible repetitions
8. One set of 12 repetitions Nautilus Curling Machine
9. RUSH – One set of "front pulldowns" on a Nautilus Torso-Arm Machine, using a close grip, approximately 10 repetitions
10. One set of 15 repetitions, wrist-curls with a barbell
11. One set of 15 repetitions, reverse barbell wrist-curls

The "rush factor" occurs only twice during the schedule – between the 6th and 7th sets, and between the 8th and 9th sets – at those points in the workout you must move from the end of one set to the start of the next-following set as quickly as possible, and certainly in less than three seconds.

Properly performed, this schedule requires a total of seven minutes and twenty seconds – or exactly twenty-two minutes weekly, since our trainees use it three times weekly; but it would make little or no real difference in most cases if a trainee used as much as sixteen minutes for each arm workout, a total of forty-eight minutes weekly – however, it certainly would make a big difference if he rested at those points where the rush factor is called for.

And please note, the above schedule is not intended only for beginners –it is the exact schedule being used at this time by our largest and strongest trainees, some of the strongest men in the world. At times we do a bit more – but at other times we do quite a bit less; and when any doubt exists, we always do LESS. And we NEVER do MUCH MORE.

Training schedules for other muscular structures of the body are – for the most part – even briefer, and usually involve the rush factor between all sets within the cycles being used. The rush factor – movement from the end of one set to the start of the next set with almost zero delay – makes it possible to work a muscle far beyond its normal point of failure; in the above arm routine, for example, it works as follows – the 6th set, the second set on the triceps machine, works the triceps to a point of normal failure, thus "pre-exhausting" the triceps muscles for the work to follow immediately, and then the parallel dips force the triceps to become involved in work that is actually beyond the normal point of failure.

And while it might appear that a similar result could be produced in another obvious way – by gradually reducing the resistance on the triceps machine, so that the triceps could continue to work until simply unable to continue even with no resistance – in practice this does not produce results on the same order; for at least two reasons – because the repetitions thus become far too high, and because the change of exercises provides needed variety of work. In this case, moving from the triceps machine – which provides full-range work for the primary function of the triceps muscles – to the parallel dips – which provide work in the position of contraction for the secondary function of the triceps, as well as the position of contraction for the primary function – makes it possible to work much more of the actual mass of the triceps muscles, while still not moving outside the limits of the recovery ability.

A very similar principle is involved in the work for the biceps, when you move immediately from the second set on the curling machine to a set of front pulldowns.

No amount of exercises performed in another fashion will produce equal results – and increasing the amount of exercise almost always reduces the production of results, even when similar principles are employed; or, in fact, especially when similar principles are employed, because this actually is HARD exercise – you not only don't need much of such exercise, you literally can't stand much of it.