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The Real Value of Exercise

Webster defines exercise as: exertion of the muscles to maintain bodily health.

I would define it differently. Exercise is movement against resistance. Without resistance, there is no exercise.

And it should be clearly understood that the QUALITY of the resistance determines the VALUE of the exercise.

As simple as the above points are, it nevertheless remains true that most people still fail to understand them. As a result, we see millions of people practicing worthless exercises — or performing worthwhile exercises in such a manner that little or none of the potential value is ever realized.

Twenty years ago, almost all athletic coaches were sincerely (if mistakenly) convinced that progressive weight training would destroy the abilities of their athletes. Today, most coaches are clearly aware of the fact that properly applied weight training will improve the performance of any athlete, in any sport. But we are still a long distance away from universal acceptance of weight training in connection with athletic training — and we are an even greater distance away from widespread understanding of the actually simple principles involved.

Weight training is capable of producing results that are utterly impossible to produce in any other manner — and this is true only and simply because weight training provides MORE resistance, and BETTER resistance. Weight training provides resistance where it is needed, to the degree that it is needed. Or, at least, it can provide such required resistance — and it will, if properly applied.

Running provides resistance — swimming provides resistance — jumping provides resistance. Any sort of muscle-powered movement is met by some type of resistance — air resistance, water resistance, gravity, friction, or some other type of resistance.

All that weight training does is CONTROL such resistance — making it possible to apply the resistance where it is needed.

In theory, it might appear that the ideal exercise would be one set of one repetition with maximum-possible resistance — a heavy, single-attempt lift with so much resistance that it would be impossible to perform two repetitions.

But in practice, far better results are produced by using less resistance — an amount of resistance that will permit the performance of at least several repetitions. How many repetitions? Within reasonable limits, the exact number of repetitions doesn't make much difference in the production of results — so long, at least, as each set is carried to a point of momentary failure. An exercise is properly terminated only when the involved muscles are momentarily exhausted to the point that another repetition is impossible in spite of maximum-possible effort.

When exercises are performed in the above outlined manner — the CORRECT manner — then very little in the way of exercise is required in order to produce maximum-possible results.

But if exercises are not performed in that correct manner, then no amount of exercise will ever produce the degree of results that would have been produced by a very small amount of proper exercise.

You can perform a hundred sets of a hundred repetitions in the curl and press with a pair of five pound dumbbells — a total of 10,000 repetitions — and you can do so daily for the rest of our life, and you will NEVER produce much in the way of worthwhile results. So it certainly is NOT a large amount of exercise that is required.

For maximum-possible results, you should train not more than three times per week — and in many cases only twice each week.

You should seldom (if ever) perform more than two sets of any one exercise — and in many cases only one set of each exercise is required, or even desirable. And your training MUST BE PROGRESSIVE. When you can perform ten (or more) repetitions with 100 pounds, then increase the resistance — if you continue to train with the same resistance, then growth will be very slow, or will stop altogether.

The above points are not opinions — they are simple FACTS. Yet, attempting to run in the very face of those facts, millions of trainees continue to use routines that are of little or no value. Thus most of the potential value of weight training — the REALVALUE of weight training — is never realized. Millions of hours of training time are wasted — when an actually small percentage of that wasted time could have produced very worthwhile results.

Make no slightest mistake about the next point —THE MOST COMMON MISTAKE IN TRAINING IS OVER-TRAINING, GROSS OVER-TRAINING, OVER-TRAINING CARRIED TO REDICULOUS EXTREMES.

It is literally impossible for a conditioned athlete to train too hard — but it is easily possible for anybody to train too much.

The real value of weight training has been largely misunderstood — primarily, I think, because the simple cause and effect relationships that are involved in exercise of any kind are not clear to most trainees. Myth replaces fact, common belief forces out common sense.

Viewed in simple terms, exercise is capable of producing only two worthwhile results. Exercise can produce increases in muscular size and strength — and under the right circumstances, it will. Exercise can also produce improvements in cardiovascular ability — and under the right circumstances, it will.

Most people who consider themselves reasonably well versed on the subject of exercise sincerely believe that training activities should be directed towards one goal or the other — they believe that training for strength will do little or nothing for cardiovascular ability, and vice versa. But in fact, actually proper training for strength will unavoidable produce maximum possible improvements in cardiovascular ability — from the same training routine.

It is certainly possible to increase strength while doing very little in the way of improving cardiovascular ability — but the type of training that produces such lopsided results is neither necessary nor desirable, nor is it the best type of training even for building strength.

Another commonly accepted myth concerns the relationship between muscular size and muscular strength — most trainees sincerely (but mistakenly) believe that the size of a muscle has little or nothing to do with the strength of the same muscle. While in fact, the strength of a muscle is in proportion to its size.

A general misunderstanding of the above point has resulted from attempts to compare the strength of one man to the muscular size of another man — which comparisons are of absolutely no validity. One man may have very large muscles and yet be quite weak — and other man may have small muscles and yet be strong — but either man will be stronger if you increase his muscular size, and either man will be weaker if you reduce his muscular size.

But the size of a muscle — and thus the strength of a muscle — is only one of many factors that must be considered. If the muscular attachments are poorly located, then even enormous muscles will not be capable of producing much in the way of measurable strength — but if the attachments are favorable, then even quite small muscles can lift a lot of weight. Thus we see examples of large men that are little if any stronger than the average man — and we see examples of small men that can lift a lot of weight.

A third common misconception concerns the relationship between strength and endurance. Which relationship — directly is contrary to common opinion — is also a constant. If you accurately measure a man's strength, then you have also measured his endurance — and vice versa. If you increase a man's strength, then you have increased his endurance in direct proportion — and vice versa.

A misunderstanding of the last point has resulted from attempts to compare one man's strength to another man's endurance — and from a confusion of terms, since many people confuse endurance with cardiovascular ability.

A failure to understand the above actually simple points has led to great confusion — and as a result, many different styles of training have become popular. Which is not meant to imply that all training programs should be exactly the same — but it should be understood that a proper style of training will produce maximum-possible results regardless of the goal towards which the training is directed.

The bulk of present medical opinion supports the contention that raising the pulse rate to a level of approximately 160 and maintaining it at that level for a period of ten minutes will produce everything that is possible in the way of improvements in cardiovascular ability. Yet many trainees follow such a slow-paced routine that little or nothing in the way of cardiovascular improvement is produced from any amount of training. Such slow-paced training eventually will produce results in the way of increases in muscular size and strength — but it is NOT the best style of training even for that purpose, and will do little or nothing in the way of improving cardiovascular ability.

The training routine that we are using in DeLand, Florida, moves so fast that it is almost frightening to watch — but it must move at such a pace in order to produce the results that we are producing. No other type of training will even begin to produce similar results.

The entire training program for the legs and lower back consists of only three exercises in most cases — and never more than four exercises in any case. One set of each of three (or four) exercises. A total training time of three or four minutes — performed only twice weekly. A total weekly training time of six or eight minutes.

Thirty seconds into this routine and the pulse rate hits a level of 160 to 190 — and the pulse rate will not drop below 130 until after the entire workout is completed, a period of approximately twenty-eight minutes for a total body workout, a workout covering every major muscular structure in the body, the legs and lower back, the upper back and chest, the shoulders and arms, the abdominals, literally everything.

The above-mentioned routine is the exact training program that we will use with the Cincinnati Bengals Professional Football Team starting in May of this year (1972) — it is the exact program that almost anybody should use, regardless of why they are training, no matter what their goals may be. It is the program (or, at the very least, very close to the exact program) that almost everybody will eventually use.

There are really only two factors of importance in exercise intended to produce any worthwhile results — these are: (1) intensity of effort and (2) amount of exercise. In general, one of these is a positive factor and the other is a negative factor. No amount of exercise will produce worthwhile results if the intensity of effort is too low — and if the amount of exercise is too great, then no exercise will produce any worthwhile result regardless of other factors.

And while it is perfectly natural to expect something less than total agreement on a subject of great interest to a large number of people, I would like to point out that I did not invent any of the principles that are advocated in our system of training. But I am, at least, aware of these factors — and I do understand the simple cause and effect relationships that are involved.

I am aware, for example, that you can NOT proceed around a curve track while moving in a straight line. When you come to a curve in the road, you must turn in order to follow the curve — or run off the road entirely. And just what does this have to do with exercise? Just everything — because, in fact, most human muscular structures are incapable of producing straight line movement. Instead muscles produce rotary movement.

But, by and large, most exercise equipment does NOT provide the required rotary form of resistance. Thus we find millions of trainees trying to provide resistance against a rotary movement by providing it with straight-line resistance — and obvious impossibility.

Unavoidably, then straight-line exercise devices provide resistance against only part of the movement — in other parts of the movement there is either too much resistance, which makes movement impossible, or too little resistance, which greatly reduces the value of the exercise, or no resistance at all, which provides no exercise at all. Such straight-line resistance exercise devices include barbells, dumbbells, and almost all conventional exercise machines. None of which devices provide rotary resistance, none of which devices thus provide even the possibility of proper exercise, none of which provide full-range exercise, none of which provide exercise for all of the muscles you are trying to work.

During the last fifty years, millions of people have spent billions of hours trying to figure out ways of improving barbell exercises — and most of these people have been guilty of the same basic mistake, they have tried to satisfy a barbell. Instead of trying to satisfy a barbell, we have tried to satisfy the muscles that we desired to exercise. Instead of working within the framework of the limitations imposed by a barbell, we have studied the limitations of muscles, the requirements of muscles, the actual functions of muscles.

A similar situation once existed in the field of transportation — the possible speed of travel on land was limited by the requirements of a horse, and as long as people had to concern themselves with trying to satisfy a horse then little or nothing in the way of an improvement in speed was possible.

The barbell was designed with a particular idea in mind — in an effort to make it easier to lift a lot of weight. Which is fine, if you are trying to demonstrate strength — but which is the opposite of what you need to build strength. Nautilus progressive weight-training equipment is thus the exact opposite of a barbell — Nautilus equipment does NOT make it easier to lift weight, instead, it makes it harder to lift weight.

A maximum level of intensity is an absolute requirement for producing best results — no amount of training of lower intensity will produce results even close to the results that can be quickly produced by the proper use of Nautilus equipment. And it is literally IMPOSSIBLE to provide an equal intensity of training without the use of Nautilus equipment.

But it should also be understood — indeed, must be understood — that such training can easily be overdone. When Nautilus equipment is used properly, brief training is not only a possibility but is a distinct requirement.

Which is fine for people who are able to train with Nautilus equipment — but what about trainees that must use a barbell or other conventional training equipment? Such people — which, as yet, means most people — should clearly understand that the basic principles are very similar regardless of what type of equipment is being used. Stop looking for ways to make barbell exercises easier — instead, look for ways to make them harder. T h e s t y l e of training should be strict, the form should be good, the intensity should be as great as possible within the restrictions imposed by the limitations of a barbell — train, hard, train fast, train briefly MORE training will never produce the results that can be produced by HARDER training — even a hundred light sets will not equal the value of one heavy set.

During a period of total inactivity, a muscle quickly loses its ability to function — a prolonged period of total inactivity will result in a near-total loss of muscular ability. Conversely, it is a well established fact that muscular exercise will increase muscular ability — under some conditions, at least. A logical approach to the situation thus demands a careful examination of the cause and effect relationships involved — in order to assure that the favorable factors are included in a selected program of exercise, while the unfavorable factors are avoided or held to unavoidable minimums.

A total lack of muscular locomotion (or other exercise for the muscles involved in walking and running) will eventually result in complete atrophy of the inactive muscles — however, even a very small amount of walking or running will prevent atrophy to such a degree — and it is also obvious that too much walking or running will also produce atrophy of the involved muscular structures, although for different reasons. Thus it is plain that an amount of exercise somewhere between these two extremes is the ideal amount of exercise.

Normal work seldom, if ever, produces much in the way of unusual muscular ability — regardless of the amount of such work; but even normal work will produce muscular atrophy if carried to extremes. Thus it is also obvious that work of a normal level of intensity cannot produce high levels of muscular ability — but that it can reduce the starting levels of muscular ability if too much work is performed.

From the above, three basic points are easily established.

ONE. T o o little exercise will result in muscular atrophy .

TWO. T o o much exercise will result in muscular atrophy .

THREE. Work of normal intensity is incapable of producing high levels of muscular ability — regardless of the amount of such work; and too much work of even normal intensity will reduce muscular ability.

The above points are undeniable — and the implications should be obvious; but in fact, the overall trend during recent years has been running directly opposite to the dictates of these simple points.

Thus, in practice, most trainees devote the bulk of their efforts to an actually negative factor — while avoiding the most positive factor of exercise; the average weight-trainee trains at least five times as much as he should — and very few (if any) trainees work as hard as they should.

Some few individuals eventually do produce APPARENTLY-GOOD results in spite of the fact that they train far too much and seldom train hard enough — but such individuals are rare, and the average trainee will never produce much in the way of muscular size and strength increases from such a style of training.

If the potential productivity of weightraining was judged upon a careful comparison of the numbers of trainees who produce at least some degree of visible results from their training and the numbers that produce NO VISIBLE RESULT — then the only possible logical conclusion would be that weight-training is totally without value.Yet, the truth of the matter is that progressive weight training is by far the most productive form of exercise ever discovered. And good results can be produced in at least ninety-five percent of a randomly selected group of subjects — almost without regard for the age of the subjects.

But if that is true (and it is true), then why do most trainees fail to produce even visible results — why do most trainees quit training and never train again? Primarily — and this clear fromALL of the evidence — because most subjects train improperly, train in such a fashion that little or nothing in the way of growth stimulation is produced, and usually train so much that growth would be impossible even if growth stimulation is produced.

This trend final reached the ultimate state of stupidity in the so-called Total Tonnage theory of training — a theory that tries to link the value of a workout to the amount of work performed. Which, of course, is a trend in the worst possible direction — since the amount of work is a negative factor, a factor that can easily prevent worthwhile results from exercise, a factor that can even (and rather easily) produce losses instead of gains.

It is not yet clear just how much weekly training constitutes the ideal amount of training — and, of course, there will be some variation on an individual basis: but it is clear that anything in excess of three hours of weekly training is TOO MUCH for ALMOST ANYBODY — and it is equally clear that as little as two hours of weekly training is very close to the ideal amount of training for most subjects. Many subjects produce very good results from as little as ONE HOUR of WEEKLY training — and find it impossible to make gains if they train any more than that.

Insofar as the frequency of workouts is concerned, it appears that three weekly workouts are the maximum number that anybody can stand — and many (perhaps most) subjects will produce best results from only two weekly workouts.

Muscles are capable of recovering from work carried to the point of exhaustion in a very short period of time — but in order to make such rapid recovery, muscles must make demands upon the system as a whole, and THE SYSTEM CAN NOT RECOVER QUICKLY. System recovery requires several factors — one of the most important of such factors being TIME. If a muscle is worked hard enough to produce growth stimulation, then system recovery requires complex chemical actions and reactions that can NOT be completed in much if any less than forty-eight hours. And if maximum-possible growth stimulation is produced in several of the large muscular structures, then system recovery may require three or four days. If additional exercise is performed before system recovery is complete, then losses in muscular size and strength will be produced — instead of gains.

If race horses were trained as much as most bodybuilders train, you could safely bet your money on an out-of-condition turtle — it would be unlikely that a horse trained in such a fashion could even make it around the track, and certainly not rapidly.

The purpose of training is to improve muscular strength and system condition — and if training is conducted properly, an almost steady rate of improvement will result, up to the point of individual potential. The average football player is less than half as strong as he could be within the limits dictated by his individual potential — and nowhere near in the condition that he is capable of reaching: thus this training should steadily increase his strength and condition — in fact, quite the opposite occurs in most cases. After an initial brief period of gains in strength and condition, most football players start losing both strength and condition — which fact should be an obvious clue that something is wrong with the training program. Instead, many coaches view this loss in strength and condition as proof that the players are not trying hard enough — failing to realize that the blame is directly due to the fact that the players are being overworked, are being worked to the point that system recovery (and thus muscular recovery as well) is impossible between workouts.

Thus, in fact, the only validity to the Total Tonnage theory of training is reverse validity — while the amount of work performed in a particular workout does not indicate the value of the workout, it does give a clear indication of the damage done by the workout, the extent of the demands being imposed upon the system.

But even when the above points are clearly understood — even when you are not over training insofar as the amount of exercise is concerned — it does not follow that good results will be produced by training.

In order to stimulate muscular growth, exercise must be intense enough to make utilization of at least part of the existing level of reserved ability.

In effect, in order to induce maximum growth stimulation you must attempt the momentarily impossible — or, at the very least, the momentarily very-difficult. If you can easily curl a 100 pound barbell for ten repetitions, then doing so is literally a waste of time and effort.

Instead, you must use a heavier weight — a weight that will NOT permit you to perform ten repetitions; then you must perform as many repetitions as possible in good form — regardless of what the actual number of repetitions turn out to be.

A proper style of training is certainly NOT an easy style of training — it is much easier to do an extra set than it is to perform the last two or three hard repetitions in a properly performed set; but these last two or three repetitions are actually the only productive repetitions in the entire set — and if they are skipped, then the entire potential benefit of that set was missed. The first few repetitions in a set are nothing more nor less than preparation — they exhaust the muscles so that the last few repetitions can make demands that fall inside the momentarily existing levels of reserve ability. Without which demands, growth will never occur.

But, you might be tempted to ask, most trainees seldom work that hard, and yet they do produce gains; how do you explain that?

Right — most trainees SELDOM work that hard; but they do work that hard at least some of the time — even if only during one set a week. And ALL of the results they produce are produced by those few hard sets — the rest of their training is wasted, does nothing to stimulate growth. And that is exactly why most trainees produce such slow rates of growth.

So, in the end, it comes down to a few actually very simple points — you must train HARD, literally as hard as possible, but you must NOT train too much.

During the last year alone, several hundred trainees have visited our training facilities at the DeLand, Florida, Public High School for the purpose of trying the new system of training — most of these subjects being advanced trainees who have reached sticking points in their training, individuals who have produced at least an obvious degree of visible results but then found it impossible to make additional gains in size and strength. By putting these subjects on a very brief but very hard training program, we have been able to produce rapid progress in almost every single case — many of these subjects have experienced more increases in muscular size and strength within a period of two or three weeks than they were able to produce within an equal number of years while training in the usual manner. Which — to us — has not been surprising; because the usual style of training practiced by advanced trainees literally prevents much, if anything, in the way of continued progress beyond a certain point.

None of the above is meant to imply that literally anybody can produce outstanding levels of muscular size and strength — outstanding individuals are just that, OUTSTANDING, and the potential for outstanding development does not exist in the average individual. However, the average individual makes very little use of the potential that he does have — even after years of steady training, most subjects are nowhere close to the limits of their individual potential. Why? Simply because barbells are tools — and, like any tool, they are subject to misuse. Barbells make it possible to perform exercises that are extremely productive — but owning a barbell does not insure that a particular trainee will understand the proper utilization of his tool, nor does it assure actually proper use even when such an understanding does exist.

Which brings us to the next important point — a point that is apparently almost impossible to clearly describe in writing — the proper form of training, the correct style of training. It is easily possible to go through the motions of training as outlined in even a very good manual on weight training — while producing NOTHING in the way of

worthwhile results. Just as smearing a certain quantity of paint on a canvas does not produce a painting, lifting a certain amount of weight will not necessarily produce gains in muscular size and strength — of far more importance is just how you put the paint on the canvas, and just how you lift the weights.

Yet, in fact, the basic rules concerning proper form are very simple — even if seldom followed.

ONE. A certain guide figure should be set for the number of repetitions. Within reasonable limits, it doesn't really matter just how many repetitions are selected — although, in most cases, a number below six or above twenty should not be used. We usually use either ten repetitions or fifteen repetitions as our suggested guide figure.

TWO. Then an amount of weight is selected that is heavy enough to make it impossible for the subject to perform the selected guide figure of repetitions — MOMENTARILY IMPOSSIBLE.

THREE. Having decided on a guide figure of repetitions, and having determined the proper amount of weight — then you should perform as many repetitions as possible without cheating. Regardless of what the actual number proves to be — do not stop even if you are able to reach the selected guide figure, if you are capable of doing more repetitions then do them — and do not stop at any number of repetitions so long as it is possible to continue.

FOUR. The speed of movement should be held back during the first three or four repetitions — that is, you should NOT move the weight as rapidly as possible during the first few repetitions. But, during the last few repetitions, you should move as fast as possible — as fast as momentarily possible — which, in practice, will be quite slow, since you will be nearing a point of exhaustion and your momentary power potential will be far lower than it was at the start of the set. By the time you reach the end of a properly performed set, your momentary speed of movement should be reduced literally to ZERO — you should not be able to move at all.

FIVE. During the entire set, it is important to limit the work to the muscles that you are trying to work. In a curl, for example, this means that the weight must be raised ONLY by the muscles of the arms — not by swinging the weight up — in a press, this means that the weight must be raised ONLY by the muscles of the arms and shoulders — not by jerking the weight up.

SIX. However, the above point is not meant to imply that cheating methods should NEVER be used — they should be used, in almost every set of every exercise; but they should only be used at the end of a set — and they should only be used when it is literally impossible to move the weight in any other manner — and they should only be used to the minimum degree necessary, cheat only enough to make another repetition possible, not enough to make it easy, cheat only enough to get another repetition started when it is impossible to start it without cheating, but don't cheat so much that the weight moves rapidly, easily to the top position.

Properly cheated repetitions at the end of a set are of great value — improperly cheated repetitions are of no value at all.

SEVEN. Make every possible effort in the direction of progress — constantly attempt to increase the number of repetitions or the amount of weight used, or both. But do NOT sacrifice form in an attempt to produce progress.

All of which is quite simple — but most of which is obviously not clear to a majority of trainees, who usually train in such a sloppy fashion that their training efforts are largely (or wholly) wasted.

Most students must be TAUGHT — and most weight trainees must be COACHED; some few people can and will teach themselves — and a few trainees can and will coach themselves. Most subjects can not — or will not.

Increases in muscular size and strength can be produced in almost any subject — if the subject will do precisely what he is told, no more and no less, and in exactly the manner in which he is instructed. But in practice this is difficult to accomplish — simply and only because most subjects will not do as they are instructed.

In other chapters, I will continue this discussion on the basic points involved in progressive weight training with a chapter on the subject of the problems with weight training and the solutions to those problems.