

# Nautilus Bulletin #2

# 28

## The Fourth Step

Anatomical charts of the human muscular structure unavoidably give a somewhat distorted impression of the major muscles – it is thus a common misconception that the muscles are entirely separate, that each muscle is an entity unto itself; but in fact, the actual interweaving of muscles is such that it is sometimes almost literally impossible to separate and accurately identify them – and secondly, recent work on neurological patterns makes it obvious that many of the previous assumptions regarding the actual contributions of particular muscular structures to specific movements were invalid. Careful tracing of nerve patterns has indicated that nerves frequently pass entirely through one muscle and terminate elsewhere. In the past, it was generally assumed that these nerves served the first muscle, but it is now obvious that in fact they are involved in the functions of the second muscle in such situations.

All of which is really of no practical concern for our purposes here – so long as we are clearly aware of the implications; human muscular structures are capable of an almost infinite number of individual movements if we consider all of the possibilities and combinations, and attempting to provide a separate exercise for each of these possible movements would certainly be impractical at the very least – but if we consider only major movements, then the number of functions are such that "almost all muscles are involved in almost all movements" (at least in gross terms and in a general sense), it becomes obvious that an actually very limited number of exercises can provide the required work for all of the muscular structures.

In general, the value of an exercise can be fairly judged on the basis of the following considerations; an exercise should (1) be a "full range" movement, providing resistance over the entire possible range of movement from a position of full extension of the prime body-part involved to a position of full contraction of the same body part (extension and contraction, in this instance, being applicable to the major muscular structures involved, rather than to the body-part itself; since many situations exist where contraction of a muscle results in extension of the prime body-part involved – the function of the triceps being one such example) – (2) involve as many major muscular structures as possible; in effect, everything else being equal, a compound movement is superior to an isolation movement – (3) provide resistance in the position of contraction of the major muscular structures involved; in effect, an exercise that permits "locking out" under the resistance in a position of contraction is inferior to an exercise where resistance remains constant – (4) involve as much total muscle mass as possible; in effect, the greater the mass of involved muscles, the greater the value of the exercise.

But if we consider those required characteristics for a "good" exercise, it becomes obvious that at least some of them, in at least some situations, are mutually exclusive; in order to provide one of the requirements, it is frequently necessary to make use of an exercise that provides none of, or at least not all of, the other requirements.

For example; the full squat involves a large mass of muscle, which is an advantage – it is also a compound exercise, involving a number of major muscular structures working together, another advantage – but it is not an actually full-range movement, since there is no resistance during the last part of the movement, as you come fully erect; and since you can "lock out" in the fully erect position, there is obviously no resistance in the position of full contraction of the involved muscles.

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Also, in a squat, the point of maximum resistance is encountered shortly after the start of the upwards movement, when the midline of the thighs is parallel to the floor; and in that position, the involved muscles are not in their strongest positions – thus you encounter the most resistance at a point during the movement where the muscles are not as capable of handling it as they would be at a later point during the movement, and the resistance you can handle in a squat is limited by the strength of the muscles in that particular position, not their strongest position. The muscles will be worked to their maximum ability in that one position – but will not encounter enough resistance in other positions.

Similar problems are encountered in almost all conventional exercises –but in spite of these limitations, it is still possible to outline a training routine made up of only a few basic, heavy exercises, a program that will produce very good results; the most common mistake is an attempt to include too many exercises, and the unavoidable result is that the overall recovery ability of the system cannot meet the requirements for both full recovery from the workouts and additional growth at the same time –under such circumstances, growth will be impossible, or very slow at best.

Another valid means of determining the relative values of exercises of a similar nature is to compare the actual distances of movement; everything else being equal, the greater the distance of movement, the greater the value of exercise. For example; a standing press is a much better exercise than a bench press – primarily because the distance of movement is greater in a standing press.

And from the above, it should also be obvious that the style of performance of an exercise that provides the greatest distance of movement is the best style; for that reason, bench presses with a reasonably-narrow grip are more productive than the same movements with a wider grip.

Another method – perhaps the most logical method – of judging the value of exercises involves a comparison of the power production in one exercise to the power production in another exercise; but in this case, we must be very sure that we know exactly what power really is – and what it is not. The amount of resistance involved is only one of three factors that must be considered – and we must also consider the distance that the resistance is moved (moved vertically), and the time involved, the speed-of-movement.

Most people consider the bench press a "power lift" – assuming that more power is required in a bench press than in a standing press; but in fact, quite the opposite is true – while the amount of resistance may well be greater in the bench press than it is in a standing press, the other two related factors are both reduced in the bench press, the distance-of-movement and the speed-of-movement are both less in a bench press than they are in a standing press. And in almost all cases, more power is actually produced in a maximum-possible standing press than in a maximum-possible bench press.

But again, the style of performance is an important factor – all exercises should be performed in a style that results in maximum-possible power production "by the muscles that you are trying to develop." A jerk-press will produce a faster speed-of-movement and thus more power than a military press; but most of the power is not produced by the muscles that you are usually trying to develop from pressing exercises, the triceps, the deltoids, and the trapezoids. So, for developmental purposes, exercises should be performed in a style such that most (or all) of the power is being produced by the muscles that you are trying to develop.

Which does NOT mean that cheating methods should never be employed; they should be, in almost every set of every exercise – but only after a point of failure has been reached while performing the movements with good form. Two or three cheating repetitions performed at the end of a set of several repetitions performed in perfect style will force the muscles to work beyond a point of normal failure; but it is extremely important that such permissible cheating should be restricted to the minimum amount required to complete the movements – in effect, cheat to make the last two or three repetitions possible, not to make them easy. Properly performed, the cheated repetitions should be brutally hard.

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So now we have the following points to add to our list of basic points . . .

13. Muscular functions are interrelated to such a degree that it is almost impossible to isolate the function of one particular muscle.
14. The value of exercise should be judged upon a basis of power production.
15. Compound movements are usually superior – for developmental purposes – to isolation movements.