

Nautilus Bulletin #2

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Barbells: Pro and Con

By comparison to any previously-existing tool intended for the same purpose, the barbell is almost a miracle machine – with proper use, a barbell is capable of producing degrees of muscular size that are almost unbelievable; so the barbell is certainly a good tool – but it still leaves a great deal to be desired.

The physical – and physiological – factors responsible for the shortcomings of the barbell are actually quite simple, but largely misunderstood. Because the "direction of resistance" provided by barbells is unidirectional (one-directional), it is obviously impossible to provide "rotary resistance" with barbells; and, because the involved body parts moved by human muscles function in a rotary fashion, it is thus impossible to provide resistance against such movement throughout the entire possible range of movement involved in most exercises.

Also, because of the way in which muscular contraction occurs, it thus becomes impossible to provide any resistance at all in the position of full contraction in most barbell exercises –and since all of a particular muscular mass can become involved in any form of exercise only in a position of full contraction, it is thus impossible (with barbells) to exercise muscles in their strongest positions.

To an individual with even a reasonable knowledge of basic physics (as it applies to barbell exercises) and a knowledge of human muscular function, the above two paragraphs should make the situation very clear; but, unfortunately, those qualifications eliminate almost all weight trainees –the very people who most need to understand these simple facts generally lack the educational background for anything even approaching an actual understanding. And, equally unfortunately, most of them "think they understand," when in fact they don't.

The very existence of a so-called "sticking point" – a point during the exercise movement where the resistance feels heavier than it does at other points – should make it obvious that the muscles are being worked harder in some positions than they are in other positions. Likewise, if you are aware that you can "lock out" under a barbell in some positions – and thus support the weight without any significant muscular action – then you should also be aware that the muscles are not being worked in those positions.

All experienced bodybuilders are aware of both sticking-points and their ability to lock-out under the weight in some positions, but few have any idea of the significance of such things; both of these factors (sticking points and lock-out ability) are direct results of the fact that you are trying to provide constant resistance against a rotary form of movement by using a reciprocal form of resistance – an obvious impossibility.

You cannot proceed around a curve in the road by continuing to move in a straight line – and rotary resistance must be provided against rotary movement if you are trying to exercise muscles in all positions.

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Using Nautilus exercise machines – which do provide rotary forms of resistance – we can produce a degree of muscular "pump" that is several times as great as the maximum degree of pump that can be produced by any amount of barbell exercise: and this is clear proof of the fact that a far higher percentage of the actual number of fibers contained in the muscles being exercised are involved in the work. Such pumping is a result of the fact that working muscles require more circulation; if only part of a muscle is working, then a small degree of pump will be produced – but if the entire muscle is working, then a simply enormous degree of pumping is produced from a very small "amount" of exercise.

In several cases – with extremely muscular individuals – we have been able to produce a degree of pumping that resulted in a temporary doubling of the mass of the upper arms; after less than eight minutes of such exercise, the arms of these subjects were swollen to literally grotesque proportions.

With a less muscular individual, a very similar degree of pumping will be produced but will not be so obvious – because a large part of the mass of the arms will be fatty tissue (which, of course, does not pump as a result of exercise), and the actually muscular mass of the arms may represent as little as fifty per cent of the total mass of the same limbs.

In a similar vein, we have long noted that there is very little difference in the measurement of a "fat" arm hanging in a straight and relaxed position and the measurement of the same arm in a bent and flexed position; a recent visitor had a relaxed upper-arm measurement of 18 1/8 inches and a flexed measurement of 18 1/4 inches – a difference of only 1/8 of an inch. When he asked me why there was such a small difference, I told him, "... because you can't flex fat."

But, back to the subject at hand – the value of barbells, and the problems with barbells; when the basic physics involved in the situation is clearly understood, it becomes obvious that barbell exercises tend to provide resistance for muscles only in their weakest positions (or nearly-weakest positions), and that little or no resistance is provided in the strongest positions of the muscles involved. Just "why" a muscle responds (by growing) when it is exposed to a work-load of great intensity is really of no importance – so long as we are aware that this response is thus created; but it should be obvious that growth-stimulation cannot be induced if there is literally no imposed resistance – and in most barbell exercises, that is exactly the situation that is encountered in the fully contracted positions of muscles.

In later chapters devoted to the correct style of performance of barbell exercises, I will go into exact details of the physics involved; but for the moment, I will restrict my comments to general observations on the subject.

In spite of the lack of rotary resistance in barbell exercises, we do encounter a certain amount of "variation of resistance" in such movements –which is a mixed blessing; in some cases the variation of resistance encountered in barbell exercises is a decided advantage – and in some instances it is disadvantageous. Sometimes both advantages and disadvantages are encountered in the same exercise; for example, in the barbell curl (or in any form of conventional curling) the effective resistance or actual "torque" increases as the movement progresses from the starting position up to the sticking-point – but having passed the sticking-point, the torque rapidly decreases to the point of zero. This effective variation of available resistance is a decided advantage during the first part of the movement because the resistance is thus increasing at the same time that the available strength for producing the movement is increasing – but after passing the sticking point, the resulting decrease in resistance is a decided disadvantage.

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In a few conventional exercises, because of the restricted ranges of movement or because of other factors, it is possible to perform the movements in such a way that the available variations in effective resistance are entirely positive in nature – even if perhaps not perfect; in such cases, a barbell is the tool of obvious choice – for several reasons, because of cost, ready availability, and convenience. The best of such exercises are wrist curls, calf raises, stiff-legged deadlifts, shoulder shrugs, side raises, sit-ups, and leg raises. All of these should be performed in such a manner that the resistance increases throughout the movement – which style will not result in the exactly "right" rate of resistance increase, but will at least be a great improvement over the normal style of performance.

As should be obvious by this point, a general practice should be to avoid barbell exercises which involve definite sticking points and-or points where it is possible to lock-out under the weight – and seek barbell exercises that are not so restricted; but there are exceptions to that general rule –the squat, the press and the curl are such exceptions, and these movements are productive in spite of the limiting factors encountered, if not nearly as effective as they would be without such limitations.

But as the intelligent reader might expect by this point, the fact of the matter is that most bodybuilders avoid the hardest – and thus the most productive – styles of performing these good basic barbell exercises; paradoxically, these movements are avoided for the same reason that they are productive – because they are a very "hard" group of exercises if properly performed.