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3

The Functions of Muscular Structures

While most experienced bodybuilders are convinced that they have little if anything to learn regarding the functions of their most important muscular structures, I have yet to meet a bodybuilder who was aware of the prime function of even the most commonly mentioned muscle in the body, the biceps of the upper arm. But in all fairness, I must also point out the fact that only one medical doctor that I have questioned on the subject – out of a total of over one-hundred doctors – knew the correct answer, and this one well informed individual was a specialist in reconstructive surgery.

The prime function of the biceps is supination of the hand, twisting the hand – in the case of the right hand, in a clockwise manner; and the bending function is strictly secondary. One simple test will quickly prove this in an undeniable manner; bend your forearm back against the upper arm as far as possible, while keeping the hand twisted into a pronated ("goose-necked") position – then place your other hand on the biceps of the bent arm. You will note that the biceps is not flexed, even though the bending function of the biceps has been completed; that is to say, although the arm is bent as far as possible, the biceps has only performed part of its function – and the least important part at that. Now twist the hand of the bent arm into a supinated position – and as you do, you will feel the biceps flex. Full contraction of the biceps results in twisting the hand and forearm – and the biceps cannot fully flex unless this twisting takes place.

For that reason, you can curl more in a normal, palms-up position than you can in a reverse curl, palms-down position; simply because, in the reverse curl position, the biceps is prevented from twisting into a position of full contraction – it is thus impossible to involve all of the available muscle fibers in the work being performed, and the muscle is incapable of performing as much work.

The difference in apparent strength that is so obvious when the normal curl is compared to the reverse curl demonstrates the fact that twisting the forearm increases the bending strength of the arm – or, at least, the momentarily usable strength. This can be demonstrated by comparing usable strength available for twisting a leverage bell in various position; it will be immediately apparent that you can exert a greater twisting force with a bent arm than you can with a straight arm.

In the last chapter we noted that muscles increase their usable strength as they change their position from one of full extension to one of full contraction; and now it should be clear that this apparent variation in strength (or this actual variation in usable strength) is not quite as simple a matter as it might seem at first glance. In the case of the biceps muscle, for example, bending the arm increases bending strength – but it also increases twisting strength – and twisting the arm increases twisting strength – and also increases bending strength.

The above has been intended as only one example of the actual functions of muscular structures; my point being that actual functions and "supposed" functions (or commonly accepted functions) are worlds apart.

And just how do you propose to exercise a muscle in the best-possible manner if you are not even aware of the function of the muscle?

Another example? Well, consider the function of the pectoral muscles – an apparent paradox. If you will perform a one-arm chin (or attempt one), it will be obvious that the pectoral muscles are involved in pulling the arm down and backwards, towards the torso from the front; but if you then perform a parallel dip, it will be equally obvious that the pectoral muscles are then pulling the arms down and forwards. But since a muscle cannot "push" a body part, and can only perform work by pulling, how is it possible for a muscle (the pectoral in this case) to perform work in two apparently opposite directions – first moving the upper arm backwards, and then moving it forwards?

The answer, of course, is that it cannot work in opposite directions; but it can appear to do so in some instances. The contracted position of the pectoral occurs when the upper arm is close to and slightly in front of the body – and when the arm is moved into any other position, then the pectoral will assist in returning it to that fully contracted position, from any direction.

Yet another example. The latissimus muscle; most bodybuilders perform exercises for the latissimus muscles with a wide grip – under the sincere, but badly mistaken, impression that such a wide hand spacing provides more "stretch" than would be afforded by a narrower grip.

Secondly, all conventional forms of chinning and "pull-down" exercises for the latissimus muscles involve working the upper arm muscles; and as noted previously, the weakness of these arm muscles prevents the trainee from working the torso muscles as hard as he should for best results. This being true, then why do most bodybuilders work their latissimus muscles with the arms in their weakest possible position?

We have already seen that the arms are strongest (for bending) when the hands are twisted into a supinated position; this being so, then why make the arms any weaker than necessary – when they are already too weak for the production of best results even in their strongest position? Yet most bodybuilders do exactly that; they work their latissimus muscles while keeping the arms twisted into their weakest possible position.

By simply giving the hands the maximum possible twist in the direction of full supination, the bending strength of the arms will be markedly increased; and it will then be possible to work the latissimus muscles much harder than it would have been with the hands in a pronated position. When the elbows are forced back in line with the shoulders – as is done in behind-neck chinning and pull-down exercises – then the fully supinated position of the hands requires a parallel (palms facing one another) grip. You can have such a bar made in a welding shop for a few dollars – and its use will markedly increase the degree of results you can produce in behind-neck type chinning or pull-down exercises; the hand grips should be perfectly parallel, and should be spaced not more than 25 inches apart.

Another example? The major muscular structures of the thighs and buttocks; these muscles are commonly exercised by attempting to apply resistance that is almost exactly 90 degrees out of phase with the direction of the movement of the body parts being moved by these muscles. In the squat, the weight is pressing down in line with the spinal column; yet neither the thigh nor buttocks muscles are capable of exerting force in an exactly opposite direction – instead, the frontal thigh muscles move the lower legs forwards, and the buttocks muscles move the torso into line with the thighs (or vice versa, the thighs into line with the torso).

In effect, the frontal thigh muscles require a thigh extension for direct exercise – and the buttocks muscles require what I will term a "torso extension" for direct exercise.

A careful review of the above examples will clearly indicate that most of the major muscular structures do not perform the functions that most bodybuilders think they do – and literally dozens of other examples could be given to prove the same point. So, to be logical about the matter, you must determine the actual function of a muscle before attempting to select an exercise that is intended to develop that muscle.

The biceps muscles bend and twist the arms, so exercises must be provided for both functions – or, if at all possible, one exercise that provides proper resistance for both functions simultaneously.

The pectoral and latissimus muscles move the upper arms – what happens to the hands and forearms is of no concern to the torso muscles, or would be of no concern in a properly designed exercise; but if you must involve the arm muscles in torso exercises – as you must in conventional exercises – then at least do so only with the arms in the strongest possible position.

My real point in this chapter is this; move the involved body part that is of momentary concern into a position where the muscle that moves that member is in a position of full extension – then note the position of the body part. Next, move the body part into a position that results in full contraction of the involved muscle – and again note the required body-part position.

Then try to design an exercise, or an exercise position, which provides resistance over as much as possible of the entire range of movement – but if full-rangeresistance is impossible, as it will prove to be in most exercises using conventional equipment, then concentrate on providing the resistance in the contracted position.

A moment's consideration of the above paragraph will thus make it obvious that the so-called Scott curling bench is a step in the wrong direction; rather than being an improvement over the regular barbell curl, it actual reduces the overall production of results.

But if the slant had been in the opposite direction, so that the upper arms were held in a position almost parallel with the floor, but with the biceps side of the arm down instead of up, then the exercise would be provided where it would do the greatest amount of good – the resistance would be available in the strongest position of the arms, instead of being limited to the weakest position of the arms.

An almost impossible position to get into? It certainly is, but it can be done – and it can best be done while using a dumbbell, working first one arm and then the other. And after having worked both arms in that fashion, then immediately perform one set of about ten reps of the regular two-hand barbell curl – carried to the point of utter failure.

Perhaps the above points will start your thinking in a logical direction. But don't fall into the all too common trap of doing a particular exercise because you like it – or of avoiding exercises that are difficult. In general, the harder an exercise is, the better its results will be; don't look for ways to make exercises easier – look for ways to make them harder.