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Speed as a Factor

Using normally applied methods, it is literally impossible to accurately measure strength and the figures produced by most currently practiced methods of testing strength have little or no significance. Strength is the ability to produce power – and while it is extremely difficult to measure strength directly, we can measure power; and having done so, a reasonable estimate of strength can be made. "How much can he press?" is a meaningless question – unless we also consider "how far does he press?" and "how fast does he press?" Both of which points – distance and speed – are generally ignored in strength tests.

During a recent workout, one of our test subjects was accurately tested while generating slightly over three horsepower; disregarding the power required for raising a good part of his own bodyweight, he raised 275 pounds a distance of over two feet in less than one third of a second.

Such accurate measurements of strength require a logical approach to the matter and the use of very sophisticated equipment capable of measuring both the distance and speed factors with great accuracy; but – for most applications where measurements of strength are required – such methods are certainly not practical, and they are never inexpensive. Thus, for practical measurements of strength, another – far simpler – method is required.

Apart from actual competitive lifting, the only real need for strength tests exists as a factor required for properly charting training progress – where a subject's performances are compared to his own previous performances. This can be done with a far greater degree of accuracy if such comparisons are not made on the basis of "single attempt" lifts. Relative levels of strength should be determined by comparing a set of several repetitions to another set of exactly the same number of repetitions – but both sets must be maximum possible sets, involving the performance of as many repetitions as possible, stopped only when another repetition is impossible.

But – since maximum possible sets will not always produce the same number of repetitions – it is thus impossible to compare every set of each exercise with every other set of the same movement; accurate comparisons are possible only when maximum possible sets result in the exact same number of repetitions.

In practice, it has been found that comparisons should be made only when maximum possible sets result in ten repetitions – or twenty repetitions, as the case may be. Within a given week of training, at least one such set will usually be performed in every exercise being practiced – and thus it is possible to judge the progress of individual trainees on a fairly regular basis.

But it is important that first sets of a particular exercise be compared only to first sets of the same exercise – and second sets to second sets, etc. Comparing a first set of squats performed during workout with a second set of squats performed during another workout would produce no reasonable basis for comparison.

For the greatest degree of accuracy from such methods of strength measurement, it is best to compare the last performed set of an exercise with the last set from another workout – assuming that both workouts involve the same number of sets, and that the sets being compared involved the same number of repetitions. Or, at least, this will produce greater accuracy of results when you are dealing with well-conditioned test subjects. However, when dealing with poorly conditioned subjects, then comparisons should be made on the basis of first sets; many such subjects will perform quite well during a first set, but then display a very great drop in strength when performing a second set of the same exercise.

While it is not necessary to measure the time required to perform a set of an exercise – so long as it is performed at a reasonable pace – it is necessary to consider the time involved for the performance of all the sets included in the workout. A first set should be followed by a second set of the same exercise at an interval of exactly four minutes, and a third set should be performed four minutes later – thus the total time for all three sets will be eight minutes plus the time required to perform the third set, a time somewhat over eight minutes and probably well below nine minutes, depending upon the type of exercise being performed and the number of repetitions employed.

With well-conditioned, experienced subjects it is not necessary to actually measure this time factor; such subjects will almost always perform second and third sets at very nearly the exact time specified – having become accustomed to working at a particular pace, they will "feel" when they are ready for another set, and the variation in time will usually be less than ten seconds.

But inexperienced trainees must be timed – and must be informed when to perform the next set of an exercise; if meaningful results for charting progress are desired.

Apart from the above described significance of speed as a factor for measuring strength, it is of even more importance for producing the best results from training. Every repetition of every set of most exercises should be performed as fast as possible – consistent with proper form and safety considerations; which latter point can be disregarded if the selected resistance is proper for the movement being performed.

Insofar as safety is concerned, no additional element of risk will be introduced if the weight is heavy enough – but if the weight is too light for the movement being performed, then some danger of injury will be added. For example; in performing standing presses with a barbell – or any other kind of presses – if the weight is too light, and if the lift is performed with maximum possible speed of movement, then the elbow tendon attachments may be damaged seriously. Exactly similar injuries occur with rather great frequency in baseball – when a pitcher "throws his arm out."

A fast lift involving too little resistance will tend to keep moving at the high point of the movement, and the resulting jerk can cause damage. But if the selected weight is heavy enough, then little or no danger will exist – the bar will stop at or very near the proper high point regardless of how fast the subject attempts to press it.

I will return to this point in more detail in later chapters dealing with the proper performance of exercises; but it should be remembered that best training results will always be produced when exercises are performed with as much speed as possible under the proper conditions. Quite contrary to the stereotyped opinion that most people have of weightlifters – thinking of them as slow, ponderous individuals slowly raising a great weight – well conditioned weightlifters perform at a speed that must be seen to be appreciated; but they literally must do so – the production of much in the way of power is impossible without speed of movement.

NOTE: The following chapter – "Accurately Measuring Power Production" – is included for the purpose of carefully detailing the method required for such measurements; for most readers, it will be of little or no interest, and no significant points will be missed if the chapter is skipped. However, for anybody that is concerned with such accuracy of measurement, the next chapter will probably prove of great interest – detailing, as it does, the only method we have been able to devise for accurately measuring power production by humans.