

Nautilus
&
Athletic Journal
Articles

“Negative Only” Strength Training

During the Colorado Experiment, a large percentage of exercises were performed in a “negative only” fashion. When a weight is lifted... “positive” work is being performed. The involved muscles are producing concentric contractions. And when a weight is lowered... “negative” work is involved. The muscles are producing eccentric contractions.

For a period of approximately eight months, immediately prior to the Colorado Experiment, we conducted an extensive series of tests with a number of subjects... comparing negative work to positive work. The results of these tests were clear... for the purpose of increasing strength, negative exercise is far superior to positive exercise.

For meaningful results from research, the factors being tested must be studied in isolation... thus, adding some negative work to a normal program of exercise would provide no meaningful test. Instead, a number of subjects were training in a “negative only” fashion for a period of several months. These subjects performed no other strength training of any type, and no positive work at all... the weight was lifted for them by assistants, and they merely lowered the weight.

For example, during a bench-press the barbell was lifted to the top position by two helpers, whereupon the trainee took the weight in a “locked-out” position and then slowly lowered it to his chest. Then, when the bar touched his chest, the helpers immediately took the barbell and lifted it to the top position again for the start of the next repetition. In this fashion, the trainee was performing all of the negative work, and the helpers were doing all of the positive work. For testing purposes, such a style of training was satisfactory... but it would not be a practical style of training for regular use, because the requirement for at least two helpers for each trainee would be a limiting factor.

Obviously, then, a new type of equipment was required... equipment that would perform the positive part of the work, so the trainee could limit his efforts to the negative part of the exercise. If the exercise machine lifted the weight... then the resulting exercise would be “negative only”.

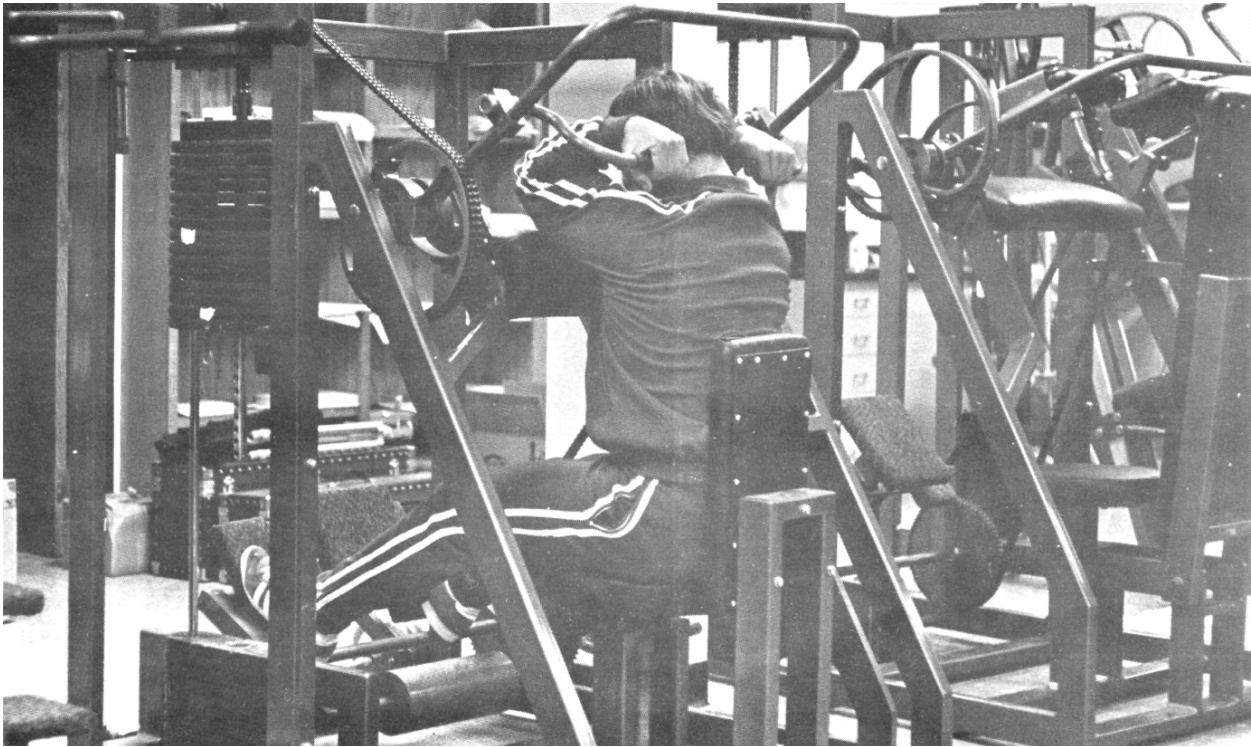
Such equipment can be built in a number of ways... all of which ways have been carefully examined by the Nautilus staff. (1) the weight can be lifted by an electric motor... (2) the weight can be lifted by a hydraulic motor... or (3) the weight can be lifted by air pressure. But there is a fourth way, a better way, a far safer way... and the new OMNI series of Nautilus Machines are built to function in this way.

For example, while performing a “negative only” curl with a Nautilus Omni Machine, the trainee lifts the weight to the top position by using the strength of his legs. The weight is leg-pressed to the top... and is then lowered by the strength of the arms. This style of training offers a number of unique advantages that are impossible in any other type of equipment. (1) An outside source of power is not required, since the trainee is performing part of the work for himself... (2) the potential danger of electrical shock is totally removed... (3) the complex structure of a hydraulic machine is not required... (4) the noise of an air-powered machine is avoided. The machine is totally self-contained.

When helpers are involved for the purpose of lifting the weight, great care must be used to avoid the possibility of dropping the weight... the “hand off” of the weight must be carefully and slowly performed, and the two helpers must be sure to release the weight at exactly the same time. If one helper releases the weight too soon, then the unbalanced load is thrown onto the muscles of the trainee... and injury may result. Or, if both helpers release the weight too suddenly, before the trainee is prepared for it, then the trainee is exposed to a dangerous magnification of forces from the resulting jerky movement... and again, injury may result.

Both of which problems are solved when the Omni machines are used... because the trainee is lifting the weight for himself, is “handing off” the weight to himself, is never endangered by an unexpected or unbalanced “hand off” by helpers. The weight is smoothly and quickly lifted to the top position by the strength of the legs, with no effort on the part of the arms... then the “hand off” from the legs to the arms is performed in a perfectly smooth manner. The arms are exposed to the weight only gradually... jerking is totally avoided, the muscles of the arms are able to assume the load as slowly as necessary.

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ABOVE... Casey Viator in a Nautilus Omni Curling Machine during the Colorado Experiment. The weight has been raised to the top position by the use of the leg-press mechanism. **BELOW...** The same machine from another angle, with the weight still in the top position... ready for the start of a “negative only” repetition of the curl.



“Negative Only” Strength Training

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The feet have been removed from the leg-press drive and the weight is being slowly and smoothly lowered by the use of the arm muscles alone... resulting in a "negative only" style of exercise for the arms.

Movement is continued until the arms have been pulled into a fully extended position... thus providing full-range exercise of the highest possible intensity, and assuring maximum increases in both strength and flexibility.



"Negative Only" Strength Training

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One of the disadvantages of “negative only” training is the fact that such exercise does little or nothing in the way of improving cardiovascular ability... because it does not produce the heavy breathing and increased pulse rate that results from positive work. But with the use of Omni machines, even that problem is solved; because the trainee is still performing the positive part of the work even when exercising his muscles in a “negative only” manner.

Strength increases are produced by exercise in proportion to the intensity of work... and “negative only” exercise provides an intensity of work that is impossible in any other manner. Cardiovascular ability is increased by exercise in proportion to the amount of work, so long as the intensity is at least high enough to result in increased breathing and pulse rate over a prolonged period... and positive work produces this requirement. Thus, with the Omni machines, the trainee is provided with both requirements... high-intensity exercise for maximum strength increases, and an adequate amount of work for cardiovascular benefits.

But the Omni series of Nautilus Machines are not limited to use in a “negative only” fashion... they are, in fact, the first and only UNLIMITED exercise machines. Machines that can be used for any possible style of training... and for some types of training that are impossible with any other equipment.

For that reason, the Omni series of machines are the ideal research tool... because they can be used for any style of training, thus providing only one “variable” during comparisons of training styles. An absolute requirement for meaningful research since the introduction of more than one variable makes meaningful comparisons difficult if not impossible.

As detailed above, the Omni series of machines can be used in a “negative only” fashion... but they can also be used in a “positive only” fashion... in a “normal” fashion... in a “negative accentuated” fashion... and in a way that was never before possible, a style of training that we call HYPER, where both positive and negative work are performed during the exercise, but with maximum intensity of work during both types of exercise.

This UNLIMITED variety of training is provided by the fact that the Omni machines incorporate a “one way” drive. The leg-press mechanism that lifts the weight during “negative only” training is designed in such a manner that it drives the resistance... but it is not driven by the resistance. Such an arrangement makes it possible for the trainee to ignore the leg-press drive and use the machine for performing exercises in a normal fashion, both lifting and lowering the weight with the muscles of the arms.

OR... the weight can be lifted by the trainee, using the arm muscles, and then slowly lowered with the legs. Thus producing a “positive only” style of training.

OR, instead... the weight can be lifted by both arms, again without use of the legs, and then lowered by only one arm. The result being “negative accentuated” training.

AND... a much heavier weight can be used, a weight so heavy that it would be impossible to lift with the use of the arms alone. In this case, the arms perform as much of the work as they can, while the legs provide only as much help as is actually required to lift the weight. Then, when the weight has reached the top, the legs are removed from the leg-press drive and the weight is lowered by the strength of the arms alone. In this fashion, the trainee is producing maximum intensity of work during both the positive and negative parts of the exercise... a style of training we call HYPER.

So five distinct styles of training are possible with the Omni series of Nautilus Machines... making these machines ideal for any possible style of training, as well as the perfect tool for exercise research, since only one variable is involved.