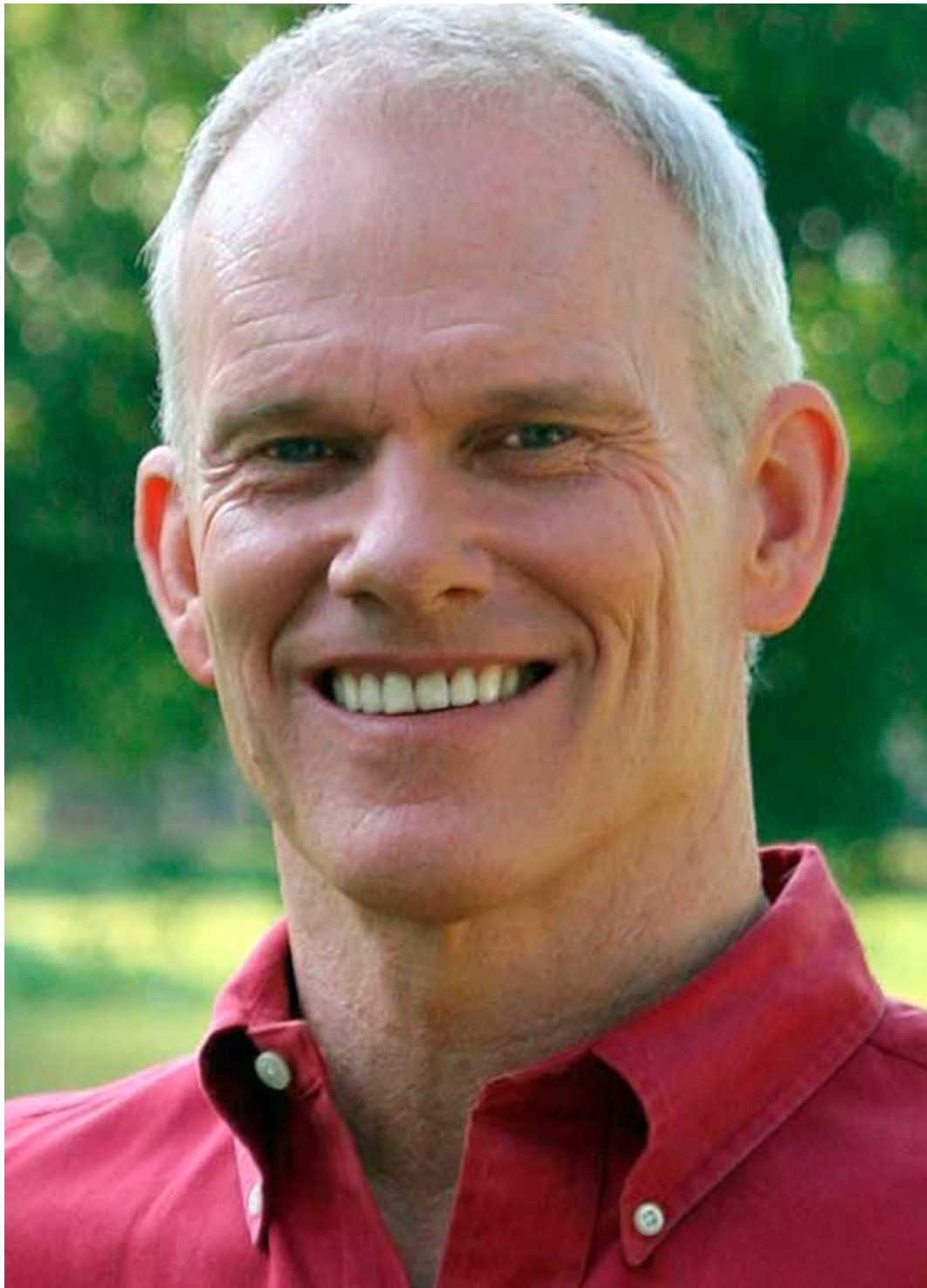


The Evolution of Eccentrics.  
Why You Need to Accentuate The Negative.

*Ellington Darden, Ph.D.*



Negative training made easy



Dr. Darden was Director of Research of Nautilus Sports/Medical Industries for 20 years and is the author of 68 fitness books ([www.drdarden.com](http://www.drdarden.com)).



## Weakness – a crime!

Beginning in the early 1900s, there were a number of bodybuilding campaigns throughout Western Europe and the United States that claimed to make the weak strong.

These promotions were started by Eugen Sandow, a European strongman and physique champion; then by Bernarr Macfadden, a health enthusiast and magazine publisher; and finally by Charles Atlas, winner of Macfadden's World's Most Perfectly Developed Man contest.

The overriding message of these advertisements, as well as their follow-up mail-order courses, was . . . Weakness is a crime. Said another way . . . A lack of muscular size and strength is a disservice to self, country, and humanity.

These courses motivated millions of males – before, during, and after World War I and World War II – to get bigger and stronger.

Throughout those years, the basic method of gaining strength involved lifting weights, most often barbells and dumbbells – mixed with body-weight exercises such as push-ups, sit-ups, and chin-ups. Such routines focused on the lifting or positive phase, with little regard to the lowering or negative.

In 1972, Arthur Jones initiated a more-advanced plan with his negative-accentuated Nautilus techniques. Jones proved the effectiveness of negative training, but was unable – after many attempts – to design and manufacture a machine that supplied it efficiently.

Ten, twenty, and thirty years passed and there was little progression – other than cosmetic – in the function of strength-training equipment. More recently, almost all leg, torso, and arm machines from popular manufacturers contained the same characteristics. Nothing was unique.

But that's going to change in 2009.

For the last two years, in an isolated biomechanical laboratory in Sweden, exercise-machine evolution has been moving forward at a fast pace. An innovative, refined, negative-training system – which is more productive than Jones's method – is ready to emerge.

Mats Thulin of Stockholm, Sweden, is prepared to launch X-Force.

Thulin has owned and operated together with two partners, over the last three decades, 127 fitness centers throughout Scandinavia. With his knowledge of club management, devotion to exercise physiology, and grasp of engineering – in conjunction with the design help of a Swedish automotive team – Thulin brings X-Force equipment to the market.

The ingenuity of the X-Force machine is a patented, tilting weight stack that unloads the positive phase, and then, overloads the negative. X-Force equipment supplies negative-accentuated exercise – 40-percent extra negative resistance compared to the positive – without the use of assistants, in a series of 14 strength-training machines.

Roll over Macfadden and tell Atlas, Sandow and Jones the News!

X-Force machines signal an end to weakness . . . and the beginning of a new era in strength-training equipment.



X-Force™ Pec Seated Press

## Defining a few terms

The performance of a strength-training machine, or a barbell, requires the raising and lowering of resistance.

When you raise the selected resistance on the weight stack, you're moving vertically against gravity and performing positive work, or in the language of physiologists, concentric muscle action is occurring.

Lowering the weight under control brings gravity into play in another fashion. The lowering portion of an exercise is called negative work or eccentric muscle action.

During positive work, your muscle fibers are shortening. During negative work the same fibers are lengthening.

In the simplest terms, observing the weight stack move during an exercise reveals: up is positive, down is negative.

(Note: In physics, positive and negative are terms that refer to the resistance or external load. While these terms are not always technically correct in their applications in this article, their interchangeable use – positive = concentric and negative = eccentric – is accepted by athletes, coaches, and fitness-minded people.)

## Looking back

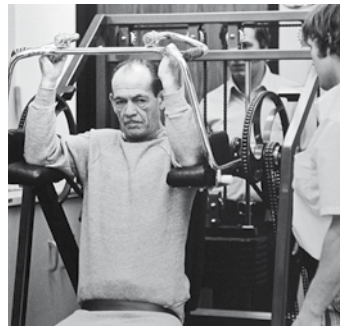
When I started training with weights seriously in 1959, no one paid any attention to the negative phase of an exercise. Using mostly barbells and dumbbells, we performed the positive part of each repetition with concentration. The negative phase, however, was done mindlessly. Sometimes the weight was simply dropped.

Generally, most individuals who strength trained didn't give the negative any attention. They just focused on the lifting.

My training continued in the above style until 1972. In the summer of that year, I read an article by Arthur Jones in IronMan magazine. A year earlier, Jones had established Nautilus Sports/Medical Industries in Lake Helen, Florida, and begun manufacturing a line of strength-training machines called Nautilus. In his article, Jones was ir-

ritated by the promotions of some of his competitors – competitors who manufactured friction-based machines that merely provided positive resistance. They were implying that negative resistance in a machine was a disadvantage. That prompted Jones to start experimenting with the negative phase of each repetition.

Jones was enthused by his initial gains in muscular size and strength. Toward the end of the article, he challenged bodybuilders not to think in terms of how much you can lift, but in terms of how much you can lower. That made a lasting impression on me.



Arthur Jones is shown doing negative-only pullovers on a Nautilus machine. Notice that Jones had a spotter on the side and a spotter in the back. Their job was to do the lifting or positive part of each repetition.

## A 1972 study

Several months later, I was in Munich, West Germany, at a scientific congress preceding the 1972 Olympics. In one of the sessions, Dr. Paavo Komi, a Finnish physiologist, described how he had trained a small group of Scandinavian weightlifters by having them lower – not lift – heavier-than-normal barbells from overhead to the floor.

His study then compared the effects of positive and negative work on the electrical activity of human muscle. He believed that his negative training of the Scandinavian lifters just might provide them with an edge in their approaching competition. Several days later, one of Dr. Komi's athletes won a gold medal and two won bronze.

I told Dr. Komi I was interested in his ongoing research and wanted to keep in touch. I also mentioned that I would soon be working with Arthur Jones at the Nautilus headquarters. Dr. Komi indicated that he'd experimented using hydraulic machines to help lift extremely heavy barbells for his athletes, but the machines had been difficult to manage.



## Arthur Jones's leap forward

In September of 1972, when I returned from Europe to Florida State University to complete my post-doctorate study in nutrition, I phoned Jones and told him about Dr. Komi and his research with negative work. "Bring those reports to me immediately," Jones replied. "We don't have any time to waste."

The next day I drove to Lake Helen and gave Jones Dr. Komi's printed materials. Jones read them, shook his head several times, smiled, and led me outside, around a corner, and into a secluded factory shop where prototypes were designed. "Feast on this, Ell Darden," he said, as my eyes bulged at a sea of large, heavily constructed machines – which he was calling Omni.

By the end of the day, Jones had convinced me that the lowering of heavy weights correctly was almost always ignored, yet was a central factor in achieving maximum results.

In Jones's negative training, the selected resistance on each machine was approximately 40-percent heavier than you normally handled for 10 repetitions. As a consequence, one or two people were required to do the lifting or positive phase for you. Then, it was your job to lower smoothly the resistance back to the bottom position. Your assistants lifted the weight again, and you lowered it under control.

The object of Jones's negative exercise was to lower the weight slowly, very slowly, but without interrupting the downward movement. At the start of a negative set, you should be able to stop the downward movement if you try, but do not try. After 6 or 7 repetitions, you should be unable to stop the downward movement no matter how hard you try. However, you should still be able to guide it through a smooth descent.

Finally, after 2 or 3 more repetitions you should find it impossible to stop the weight's downward acceleration. At that moment, you should terminate the set.

Properly performed negative exercise, Jones concluded, assures more complete exercise of the muscles because the resistance always moves at a smooth, steady pace and, as a result,

provides more thorough stimulation of the muscle fibers. This is in contrast to a tendency to jerk and drop resistance, the manner in which a great deal of lifting was performed then and even now.

There were logistics issues, however, with Jones's negative training.

## Training challenges

First, is the paradoxical problem of your own strength gains. As you become stronger quickly from negative work, you must recruit two or more spotters to help with the lifting. Such serious lifting soon becomes boring for even the most motivated assistants. Furthermore, this lifting, especially on heavy leg presses and pullovers, has to be very coordinated or it can become dangerous.

Second, is the problem of continuity, maintaining the intensity of your negative work. You can easily lapse into resting too long between repetitions. A pause, or lag time, of only 3 seconds allows sufficient muscle recovery to give the illusion of improved performance, while undermining the anticipated training effect.

Furthermore, rest intervals of 3 seconds or longer between repetitions equate to performing a series of single-attempt efforts. Not only is this inefficient, it also increases the risk of injury.

## The machine stalemate

Jones was in a quandary over designing machines with significantly more resistance on the negative stroke than on the positive stroke. He made many attempts – first, the Omni machines, which supplied a foot pedal to lift a heavier-than-normal resistance with the legs and then lower it with the arms; and last, with his servo-electrical machines that could be computer programmed to supply more resistance on the negative. Jones's endeavors provided benefits, but the machines were cumbersome and complex.

Jones sold the Nautilus corporation in 1986, and later retired from his follow-up company, MedX, in 1996. He died in 2007, without solving how to construct an exercise machine successfully, with less positive and more negative resistance.

## The Swedish solution: The missing key

On November 13, 2008, I traveled to Stockholm, Sweden, to meet with Mats Thulin, whom I had met in 1980 at a Nautilus Training Seminar in Florida. Mats later became a distributor of Nautilus equipment in Scandinavia. Thulin had phoned a month earlier, enthusiastic about what he called, “a new way to accentuate the negative, without the use of the legs or the help of an assistant.”

In Stockholm, when I critically examined what Thulin had done – and applied it under workout conditions – a lightning bolt went off in my head . . . “This is the MISSING KEY. Why didn’t Arthur, one of his engineers, or even me – think of this approach decades ago?”

The approach that Thulin applies so effectively involves a tilting weight stack powered by an electric servomotor. As the user begins the positive stroke, the weight stack leans to a 45-degree angle – instantly reducing the selected resistance by approximately 29 percent. At the apex of the positive stroke, the tilted weight stack returns to vertical. The user then lowers 100 percent of the selected resistance.

Instead of continuing to search for ways to add resistance on the negative, which was the strategy employed by others, Thulin figured out a way to subtract weight from the positive.

This is a brilliant step forward in the evolution of eccentrics, as well as the advancement of strength-training machines.

For example, on the X-Force Pec Seated Press machine, let’s say you select 140 pounds. As you enter the machine, seat yourself properly, pull a lever, and grasp the handles, the weight stack tilts to 45 degrees. As you perform the positive phase, you are moving 100 pounds of resistance. (Note: 100 is 29-percent less than 140 pounds and 140 is 40-percent more than 100 pounds.)

Quickly, in 0.5 of a second, the weight stack goes back to the vertical position as you do a controlled negative with 140 pounds. Ideally, you would continue performing 100-pound positives and 140-pound negatives for approximately 7 or 8 full repetitions.

In addition, a properly shaped cam is incorporated on each machine to vary the resistance curve appropriately.



The weight stack tilted to 45 degrees



The weight stack in the vertical position



## No spotters, no lag time

Not only has Thulin solved the 36-year-old machine quandary, but he also has successfully overcome the two major problems with heavy negatives.

First, spotters or assistants are no longer needed, since the trainee should be able to lift the tilted – and thus reduced – resistance.

Second, what originally required a lag time – as the trainee rested while the assistants worked – is now filled by the trainee lifting the tilted resistance.

There's no chance to rest even partially when repetitions are performed correctly: positive, negative accentuated; positive, negative accentuated; and so on . . . as opposed to negative accentuated, rest; negative accentuated, rest; and the like.

It will take only one, properly performed set on the X-Force Pec Seated Press machine – for instance – to feel the difference, compared to a normal set where the positive and negative resistances remain the same.

The reasons why one set on an X-Force machine makes a meaningful difference are explained in the following sections.

## The importance of inroad

Inroad is the depletion of momentary strength, repetition by repetition, from a set of an exercise.

For example, let's say on a seated biceps-curl machine, you can do 10 repetitions with 80 pounds of resistance. (Note: This is a conventional biceps machine and you have 80 pounds on the positive and 80 pounds on the negative.) In spite of your best effort, you cannot do an 11th repetition. Why did you fail? Did your biceps strength go from something above 80 pounds down to zero?

Your strength did not go to zero. If you're a typical trainee, your repetition-by-repetition strength drops an average of 2-percent per repetition.

On repetition 1, you are 100-pounds strong – and 100 pounds of strength easily curls 80 pounds of resistance. On repetition 2, you are 98-pounds

strong and 98 pounds lifts 80 pounds, and so on. On repetition 10, you are approximately 80.5 pounds strong – and 80.5 pounds of strength is barely able, with a supreme effort on your part, to curl 80 pounds on the machine. On repetition 11, you are 79 pounds strong – and 79 pounds of strength will NOT curl 80 pounds of resistance.



X-Force™ Biceps Curl

Continuing that example, from one set of 10 repetitions, you've made a 21-percent inroad into your starting level of strength for your biceps. According to Jones's research, the most consistent level of muscular growth occurs when a trainee makes an inroad of from 15 to 25 percent on the majority of his exercise sets.

From my own training history, I knew that my strength was fairly typical. In fact, my average inroad on most exercises paralleled the 2-percent, repetition-by-repetition, inroad described above. On most of my exercises, I could expect to perform approximately 10 repetitions with 80 percent of the resistance I could do one time maximally. Using a repetition style of 2 seconds on the positive and 4 seconds on the negative, then 10 repetitions required approximately 60 seconds for me to perform.

## Inroad comparisons

When I arrived in Stockholm, two machines, the X-Force Horizontal Leg Curl and the X-Force



Biceps Curl, caught my attention. These machines, minus the tilting weight stacks, are almost identical to ones I have in my private gym in Florida. Perhaps I could make some valid inroad comparisons between X-Force and my normal weight-stack machines?

The following day, on the X-Force Horizontal Leg Curl and the X-Force Biceps Curl, I calculated and selected the same amount of resistance for the positive phases as I had used the week before in Florida. Each repetition, however, would supply 40-percent more resistance on the negative phase. My goal was to perform as many repetitions as possible, using a 2-second-positive and 4-second-negative count.

Interestingly, on both X-Force exercises, I barely completed 7 repetitions and reached momentary muscular failure at approximately 42 seconds. The week before, using my conventional leg curl and biceps curl machines, I had reached failure on each at 10 repetitions and 60 seconds.

This demonstrated to me that, with these X-Force machines, I achieved the same inroad, 21 percent, in 42 seconds, as opposed to 60 seconds. Thus, the X-Force Leg Curl and Biceps Curl machines, for me, were 50-percent more demanding per repetition (3-percent inroad versus 2-percent) and required 30-percent less time to failure (42 seconds versus 60 seconds).

Those two factors, degree of inroad per repetition and time required to failure, showed me that X-Force machines, compared to conventional equipment, provides more-efficient inroads. From my 30 years of training thousands of individuals, it's been my experience that growth stimulation is closely linked to inroad and a more efficient inroad is increased assurance of growth stimulation.

X-Force's accentuate-the-negative concept has my vote for efficiency in action.

### The mechanics of muscular growth

If the necessary inroad has been achieved, how does the involved muscle actually grow larger and stronger?

Muscular growth takes place at the microscopic, cellular level. The basic cells are called sarcome-

res. Inside each sarcomere are strings of movement molecules called myosin, which, with tiny cross-bridges, connect to a thin protein filament called actin. Myosin, actin, and their interactions determine growth.

The key interaction must occur as a result of muscular-system overload that causes the right amount of microtears to the myosin and actin strings. When the strain on the muscle is focused and intense from multiple repetitions with controlled negatives, the movement mechanisms pull apart and tear slightly. This exposes frayed myosin and actin strands, which have the ability to attract other growth elements. With adequate rest and nutrients, these units and elements are rewoven into thicker, stronger filaments with new branches.

Thus, the units of myosin and actin increase, which causes an expansion in the size of the individual sarcomeres. Because the number of sarcomeres is set at birth, these basic units must increase their size for muscular growth to occur.

The bottom line is . . . all growth from strength training must be stimulated by preparing and then slightly tearing at least some of the involved myosin and actin tissues. That slight tearing is the catalyst for repair and overcompensation.



X-Force™ Horizontal Leg Curl

## Ten Reasons To Accentuate the Negative

After reviewing the published literature on concentrics versus eccentrics, Dr. Bjorn Alber, a Swedish sports medicine physician, concluded in 2008 that . . . Eccentric training:

1. Involves a heavier-than-normal overload – which means more force output and more muscle fibers recruited.
2. Requires greater neural adaptation – which reinforces cross-education of strength gains from one limb or side to the other.
3. Insures a higher level of stress per motor unit – which supplies greater stimulation of the involved muscle fibers.
4. Recruits more fast-twitch fibers – which contribute predominantly to muscular size.
5. Causes more microscopic fiber tears – which ignite the muscle-building process.
6. Works the entire joint structure – which results in more strength, stability, range of motion, and healing properties.
7. Applies well to post-surgical therapy – which is advantageous in rehabilitation.
8. Maintains strength gains longer – which counter the detraining process.
9. Transfers strength gains to concentric work – which is valuable in lifting performance.
10. Allows greater work in less time – which means more efficient training sessions and faster results.

Note: Dr. Alber's overview was assembled from discussions I had with him in Stockholm, Sweden, on November 17, 2008, and follow-up e-mails from him on December 18, 2008.

## The physics of concentric and eccentric muscle action

Research with positive and negative work reveals that strength training obeys the basic physical laws described centuries ago by Isaac Newton. Newton's "Law of Inertia" states that an object at rest tends to stay at rest unless acted upon by an outside force. This applies directly to the lifting of a weight at the start of a concentric muscle action.

For example, in the standing barbell curl, the weight begins at rest with the biceps muscle ready to act. If the muscular force exceeds the inertia of the barbell, movement occurs and the barbell is lifted. Concentric muscle action, therefore, is used to initiate, maintain, or increase motion of an object.

An eccentric muscle action has a different effect. In Newton's "Law of Acceleration," an object that is already in motion tends to stay in motion unless acted on by an outside force. In strength training, an object that has been raised by concentric muscle action is now pulled back by the force of gravity. Only by muscular force being exerted against the descending weight can it be prevented from accelerating downward.

Concentric and eccentric muscle actions have evolved to accommodate the laws of motion. Muscle force during shortening is less than force during lengthening because it is harder to create a new bond than to break an existing bond.

The process of shortening is complex, energy dependent, and based on creating new chemical bonds. But once formed, these bonds are extremely stable and thus make the lengthening process so appropriate for overloading. That's why a person can become stronger quickly, with progressively heavier and heavier negative resistance.

Arthur Jones recognized the benefits of negative-accentuated training back in the 1970s. But beyond the initial several weeks of focusing on it, he and his trainees lost management over some important details. In other words, the resistance usually became too heavy, was not easily governed, and was not recordable.



And Jones could never figure out how to give the trainee precise CONTROL over each repetition with a properly designed, negative-accentuated exercise machine.

### Advantages of X-Force equipment and its accentuate-the-negative training

In comparison to conventional strength-training machines, X-Force equipment offers these advantages by considering the following factors:

- **Inroad:** As previously noted, because of the depth of inroad and the shorter time it takes to reach muscular failure, X-Force equipment is more efficient.
- **Stimulation:** A more efficient inroad equates to enhanced muscular size and strength increases.
- **Flexibility:** To accentuate the negative allows more effective backpressure in the flexed position and more effective stretching in the extended position. Together, this contributes to full-range movement and improvements in joint flexibility.
- **Control:** With X-Force equipment, the trainee has solo control during both the positive lifting and the negative lowering. There's no need for spotters or assistants to help with the performance of any repetition.
- **Safety:** The nature of accentuating the negative requires that each lowering phase be performed smoothly and slowly. And since the positive is always 29-percent less than the negative phase, the turnaround between the negative and positive transitions the user without straining into the next lowering phase. X-Force equipment promotes better form and safety.
- **Rehabilitation:** Because of more control, better form, and safer conditions, X-Force equipment is a valuable means of treating and working around injuries, as well as injured body parts.
- **Results:** Whatever the goals of resistance training, X-Force equipment can more efficiently provide results.

### Greater benefits for women and seniors

Young and middle-age men are the primary users of most strength-training equipment. For whatever reason or reasons, young and middle-age women and seniors (both women and men) have NOT taken to strength training in a major way. As a result, they've missed many of the potential benefits – such as improved body shape and symmetry, increased muscular strength, elevated metabolism, denser bones, and better protection against injury.

Over the last 20 years, I've written six books for women, with the most popular being: The Six-Week Muscle-to-Fat Makeover, Hot Hips and Fabulous Thighs, and Body Defining. And I have a book for seniors called Living Longer Stronger.

The programs presented in those books all involve strength training, with both exercise machines and free weights – and they're all productive. But now, each one needs to be revised and updated to include X-Force's negative-accentuated machines. X-Force's negative-accentuated machines, with smooth-adjusting turnarounds and easy-to-feel muscle actions, may be exactly what these groups need to heighten their motivation.

Young and middle-age women, as well as seniors – because they've long neglected their muscles – actually have more to gain from X-Force equipment than do most other population groups.

There is no better time to challenge women and seniors to explore X-Force training.



X-Force™ Abdominal Crunch

## Weight-Training Machines: Yesterday and Today

By Bjorn Alber, M.D.

Genesis Health, Stockholm, Sweden

Since the beginning of the 20th century, individuals have utilized weight training to increase muscular size and strength. First there were kettlebells, but adjustable dumbbells and barbells soon replaced them.

By the mid-1960s, research had proven that heavy resistance and intensity were required for optimal growth stimulation. At the same time, selectorized weight-stack machines utilizing pulleys were introduced to alter force direction and to make resistance changes more convenient.

But these machines, as well as barbells, could deliver a near maximal load only for a short part of the range of movement. In fact, a trainee was often limited by the weakest position of the involved muscle in the exercise performed.

The first real breakthrough in resistance training was the Nautilus system by Arthur Jones in 1971. These machines redefined the possibilities of exercise, and combined with the application of high-intensity training, delivered noteworthy physiological benefits.

In the mid-1970s, it was recognized that there were three components in strength-training movements: concentric, static, and eccentric. It was proven that each of these components was important to achieve maximum stimulation.

The eccentric force of a muscle, in fact, was found to be at least 40-percent stronger than the concentric; as well as, the most result producing.

A major problem, however, was that with barbells and dumbbells, the eccentric force was not higher than the concentric – and in machines it was actually lower, due to friction.

In the 1980s and 1990s, more and more evidence revealed that not only would added eccentric resistance increase the intensity and thus the efficiency of the training, it was also proven more beneficial in rehabilitation.

During the last three decades, many manufacturers have tried to produce machines that would supply 40-percent more eccentric resistance. Early machines utilizing pneumatic or electrodynamic resistance failed consistently in their applications.

In scientific testing, one success was the apparatus named Eccentric Jo-Jo – which was developed by the strength-training physiologist, Per A. Tesch, of the Karolinska Institute in Stockholm, Sweden. The machine provided extra eccentric force in leg extensions.

Professor Tesch concluded that not only did eccentric training increase muscular strength and growth faster than concentric; it also had a far better effect on the development of tendons, ligaments, joint surfaces, and the skeleton.

More recently, some manufacturers have tried to incorporate added eccentric resistance in commercially designed machines for fitness centers. But none of the machines has been able to provide a smooth eccentric force that also includes a concentric and a static component.

In 2009, X-Force will be the first commercial strength-training equipment that successfully meets these requirements.



## X-Force Routines

The initial X-Force machines are as follows:

Horizontal Leg Curl

Leg Quadriceps

Leg Press

Lat Back Circular

Lat Back Pull

Lat Back Row

Pec Arm Cross

Pec Seated Press

Pec Angle Press

Deltoid Lift

Deltoid Press

Triceps Press

Biceps Curl

Abdominal Crunch

There are many ways to organize routines with X-Force machines. One way is to alternate two routines, A and B, as listed below:



X-Force™ Leg Press

### A Routine

1. Leg Quadriceps
2. Leg Press
3. Deltoid Lift
4. Deltoid Press
5. Lat Back Circular
6. Biceps Curl
7. Triceps Press
8. Abdominal Crunch

### B Routine

1. Horizontal Leg Curl
2. Leg Quadriceps
3. Pec Angle Press
4. Lat Back Pull
5. Pec Arm Cross
6. Pec Seated Press
7. Lat Back Row
8. Abdominal Crunch



X-Force™ Lat Back Pull

Because of the physiologic demands of negative training, my recommendation is to apply an X-Force routine only one time a week. For example, perform A Routine on Monday and B Routine on the following Monday. Seven days between workouts is necessary for recovery.

Concerning sets and repetitions, I'm a believer in one set to failure. Done properly, that's all you require for maximum stimulation. With X-Force equipment, because of the added 40 percent on the negative, the repetition range for most trainees should be 6 to 8. Each repetition should be done with a count of 3 seconds on the positive, 1 second pause, and 5 seconds on the negative. Think "3-1-5" on each repetition for best results.

When you can perform 8-10 repetitions in good form, that's the signal to add more weight to that machine at the time of the next workout.

On my visit to Stockholm in November of 2008, Mats Thulin and I performed similar 8-exercise, X-Force routines and each of us finished our workouts in 15 minutes.

One 15-minute or maximum 30 minutes workout a week on eight X-Force machines should be the basic goal for frequency and duration depending on the individual fitness level.



X-Force™ Deltoid Lift

## The end of weakness

Eugen Sandow, Bernarr Macfadden, and Charles Atlas – approximately a century ago – publicized the idea that “Weakness is a crime.” This in-your-face headline worked successfully because each promoter was able to show, through his mail-order courses, the confidence-building powers of . . . bigger, stronger muscles.

Many boys and men of that era were under muscled and skinny. Often, they faced long grueling days of farm work. Food was scarce. Rest was skimpy. And a world war was looming on the horizon.

Sandow, Macfadden, and Atlas – with their muscle-development courses – offered hope . . . for pennies a day.

Millions of boys and men responded. Many applied the necessary discipline and patience – and their bodies responded by becoming bigger and stronger.

Arthur Jones, with his Nautilus machines and their popularity in the 1970s, provided more hope as thousands of fitness centers opened, purchased Nautilus equipment, and sold millions of exercise memberships throughout the United States.

Today, the landscape is different. The majority of boys and men no longer spend grueling days doing anything close to farm work. Computers have taken the place of plows and pitch forks. Food is not only plentiful, but also loaded with taste-tested calories.

Most boys and men are not skinny – they're fat.

But below those fat-thickened outer shells are inner bodies that are still under muscled and weak.

Mats Thulin and his X-Force machines deliver renewed hope. Hope based on the science of eccentrics. Hope in the form of revolutionary tilting weight-stack exercises that accentuate the negative.

*It only takes 15-30 minutes of X-Force training per week to signal: The End of Weakness.*



## The beginning of a new era: “Roll Over Beethoven”

Chuck Berry's 1956 recording, “Roll Over Beethoven,” became an anthem globally accepted as symbolizing change – change that ushered in a new era called rock and roll.

X-Force machines, likewise, symbolizes change and a new era in strength-training equipment.

With Berry's guitar riffs in the background, here's my updated ending for his classic song . . .

*Roll over Macfadden and tell Atlas,  
Sandow and Jones the News:  
With X-Force's line-up, you've got  
nothing but weakness to lose.  
Roll over Macfadden  
and dig these negative rhythm and rules.*

X-Force. Negative training made easy.



X-Force™ Lat Back Row

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Note: The information about Chuck Berry was obtained from Wikipedia, the free encyclopedia, on December 12, 2008. See [www.wikipedia.org](http://www.wikipedia.org) (search: Chuck Berry).

## Key quotes from article

“Start thinking in terms of NOT how much you can lift, but rather – how much you can lower.”

*Arthur Jones* wrote in a 1972 issue of IronMan magazine,  
From page 5

“Instead of continuing to search for ways to add resistance on the negative, Mats Thulin figured out a way to subtract weight from the positive. This was a brilliant step forward in the evolution of eccentrics, as well as the advancement of strength-training machines.”

*Ellington Darden, Ph.D.*  
From page 7

“The ingenuity of X-Force equipment is a patented, tilting weight stack that unloads the positive phase, and then, overloads the negative.”

*Ellington Darden, Ph.D.*  
From page 4

“The easier positive on an X-Force machine lets a trainee reach muscular failure on the heavier negative, not the normal positive, which is advantageous to the growth process.”

*Mats Thulin*  
From discussions on November 15, 2008

“X-Force equipment allows greater work in less time – which means more efficient training sessions and faster results.”

*Bjorn Alber, M.D.*  
From page 10



We will break you,  
and you will thank us for it.





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Negative training made easy