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Rise of the Machines

Bill Starr chronicles how Universal and Nautilus changed the face of fitness and made black iron a memory in most gyms.

By Bill Starr

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The earliest pieces of equipment used by men wanting to get stronger and build more impressive physiques were kettlebells, dumbbells and barbells with rounded globes at each end. These globes varied in size, and some were solid iron, while others were filled with shot. Then barbells advanced so plates of different weights could be added and removed from the bars. The next step in the evolution was to put ball bearings in the collars so the bars could rotate as they were lifted off the floor.

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The number of people who lifted weights as a form of exercise was meager, at best, so there wasn't a call for any other equipment. Nor were there any fitness facilities as such, but YMCAs always provided some space for weight training. The spaces typically contained the equipment I mentioned, plus stall bars, medicine balls and Indian clubs. YMCAs became hubs of weight training and continued to serve that purpose for over half a century.

In the '20s, there was a flurry of interest in physical culture, led by such icons as Bernarr MacFadden, Alan Calvert, Charles Atlas and George Jowett. These men promoted their views on weight training and nutrition in the pages of two magazines: Calvert's *Strength*, which was the publishing arm for his Milo Barbell Company, and MacFadden's *Physical Culture*. These publications fueled the movement to make people stronger and healthier, which led to a few health clubs opening up in the larger metropolitan areas. The most renowned was Sigmund Klein's facility in New York City.



Allan Grant/The LIFE Picture Collection/Getty Images

Vic Tanny is widely recognized as one of the creators of the modern fitness facility.

When word got around about Klein's successful venture, other weight-training gyms sprung up around the country. Ed Yarick had one in Oakland, California; Tony Terlazzo opened one in Los Angeles, California; George Yacos had the first such operation in Detroit, Michigan; and John Fritsche ran a profitable gym in Philadelphia, Pennsylvania. In all these facilities, the emphasis was on health more so than strength. There was one in Atlantic City named the Healthorium. Most offered massages, steam rooms, treatments with infrared lamps, and classes in self-defense and even acrobatics.

This is when machines entered the picture.

Primitive Tools

Nearly all the first machines in gyms were handmade, usually by the owner of the gym. If he didn't construct the machine himself, he designed it. Most of the equipment was crude, but it got the job done, and the owner found that the more equipment he made available to his clientele, the more his membership grew.

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To keep pace with this new competition, YMCAs also began adding equipment to their weight rooms. Nothing elaborate by any means. The first pieces of equipment I encountered were in the Wichita Falls YMCA in Texas. There was a flat bench with uprights to support a bar, a lat-pull machine mounted on a wall, a dips bar on another wall and a leg-extension/leg-curl machine. This latter piece of equipment was nothing fancy. It was a wide bench, about the size of a massage table with metal extensions, and the user could lie on his belly and do leg curls, then sit up and do leg extensions. While it was primitive by today's standards, it worked just fine. So did the pulley apparatus for the lats.

Nothing changed very much for some time. Someone came up with the idea for a staircase squat rack and a simple leg press—but nothing very innovative. Then in the '50s, the health-club business exploded, and with it came a transformation in weight-training equipment. This was due to several factors, all which happened at the same time.

Vic Tanny saw a golden business opportunity in providing the average citizen a place to exercise and opened a string of health clubs across the Western and Midwestern states. Soon after Tanny's concept proved to be a giant money maker, Jack Lalanne, using the fame he had gained from his TV show, followed Vic's example and flooded the West Coast with health clubs bearing his name.

While this was transpiring, the fitness movement was gaining momentum by virtue of the many players wanting a piece of the pie. Since the '30s, Bob Hoffman basically had a lock on the sales of weight-training equipment and nutritional supplements. The Weider brothers (Ben and Joe), Dan Lurie and Peary Rader changed all that. Those competitors began publishing magazines that expressed their views on health and fitness, with the greatest prominence given to bodybuilding.

This not-so-friendly rivalry inspired a whole new generation to get stronger and build a more pleasing physique. The YMCA was still the center of competitive bodybuilding and Olympic lifting, but the average Joe wasn't interested in having huge muscles or moving heavy weights. He just wanted to train to become more fit so he could walk down a beach with pride.

And women wanted to get into better shape as well. So began a whole new era for fitness. The number of potential paying customers suddenly doubled, and enterprising individuals, almost all with a background in weightlifting or bodybuilding, saw the chance to make a good living doing something they enjoyed, so they began opening health clubs all across the country. They sprung up in strip malls in metropolitan areas and in small towns.

The owners of these new enterprises knew their potential members wanted something different from what was being offered at the local YMCAs—something more modern, something that made training easier. And the atmosphere of these new fitness centers needed to be more inviting, so there was background music and lots and lots of mirrors. Instead of barbells, the various



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Before the '50s, fitness facilities were rugged, sparse places where equipment was often very limited. Stall bars were a fixture, as were medicine balls, dumbbells and barbells.

exercises incorporated light dumbbells and machines. These machines needed to be well crafted and pleasant to the eye. Chrome was in, and black iron was out. Even the dumbbells were chrome, and if the owner did decide to include barbells and plates, they, too, were chrome.

These small health clubs did their best to emulate those larger operations of Tanny and Lalanne. Both men and women were welcome, but the two sexes trained on different days: three days for men, three for women.

There was a machine for each of the exercises in the program, and the machines available differed from one facility to another depending on what the owners considered the

most appropriate for their potential clientele. There were machines for seated curls, flat bench presses, incline bench presses, lat pulls, and both standing and seated calf raises, as well as Smith machines for overhead pressing and squats. Pulleys attached to walls allowed for a wide variety of leg and arm exercises and, of course, leg-extension and leg-curl machines could be found.

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The workouts were designed so members could go through a workout in a short period of time and achieve the results they were seeking without any strenuous exertion. The biggest selling point of using the machines was the sessions could be done quickly. These facilities were aiming at the middle class. Time was money, and this attitude fit the needs of the new fitness generation to a T.

Universal Appeal

In the '50s, a bodybuilder and Olympic lifter from California, Harold Zinkin, came up with a brilliant idea that fit perfectly with the attitude toward resistance training in the country: He created the Universal Gym and pushed the fitness revolution forward rather remarkably in the early '60s. Instead of having a dozen or more machines scattered around the training room, all the stations were housed in one compact unit. The Universals were made of sturdy stainless steel, so they were as shiny as chrome and resistant to tarnish and rust.

Not only was his piece of equipment innovative, but the way he marketed it was also different from the way the other major players in the fitness-equipment business sold their goods. The York Barbell Company, Weider and Paramount got their orders from the catalogs they printed or from ads in fitness magazines. Universal chose a different route: They divided the country up into territories—East Coast, South, Midwest, etc. Then they found experienced salesmen in these areas and offered them an exclusive deal selling the Universals. As long as they met the quotas set for them, no one else could sell the product in their territory.



Harold Zinkin, inventor of the Universal Gym, displays impressive skill at Muscle Beach in California.

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Naturally, they jumped at the chance and began selling Universals like hotcakes. The salesmen, armed with a slick brochure, didn't target health clubs as their first objective. Rather, they went after high schools, rehab centers, physical-therapy clinics and hospitals. The response was astounding.

Schools and college administrators loved the concept. There were no free weights to deal with. The resistance was in the form of stacks that were locked into the machine, and moving from one level of resistance to another was achieved simply by changing the position of a metal pin. The Universals took up very little space, and the workouts could be done expediently. Two or three circuits around the stations and the session was over. And the Universal satisfied the most important criteria of all in the minds of coaches, athletic directors and school principals: It was extremely safe.

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By the middle of the '60s, Universals could be found in nearly every space set aside for physical fitness: YMCAs, church basements, both large and small fitness centers, rooms in homes of the affluent, military bases, and rehab centers.

Yet those who were training for strength pretty much shunned the Universals. I used them, but only for a few auxiliary movements. I liked their adjustable sit-up station and the chinning bar, and I used the pulley station to work my triceps. Other than that, I stuck with the barbell and power rack because this was also the era of isometrics. (For more on isometrics, read the CrossFit Journal article "[Short and Simple—and Effective.](#)") During the late '60s, there was a surge of interest in strength training for athletes, particularly football players. Tommy Suggs and I, with the blessing of Hoffman and York, went on a campaign to educate football coaches as to how to make their teams stronger by using free weights. We pushed the idea in the pages of *Strength & Health*; went to coaches conventions in Atlantic City, New Jersey, and Washington, D.C.; and



Underwood Archives/Getty Images

While some gravitated toward circuits that could be done on Universals, Starr says serious strength athletes stuck to barbells and free weights.

gave countless demonstrations at high schools, as well as a few colleges, such as Gettysburg, Rider, the Naval Academy, and the University of Delaware. Others, such as Russ Knipp and Gary Glenney, who held national titles in Olympic lifting, were doing the same thing in the Western states. We were spreading the word that the very best way to increase strength was by using free weights.

The campaign worked because athletes in a wide range of sports were not getting that much stronger when they used the Universal or any other type of machine. So when they went back to training on barbells, gains came quickly. The athletic community was ready for a change once again.

Collegiate and scholastic athletic programs began either selling their Universals or pushing them to the back of their weight rooms. Then they pulled the weights and bars out of storage, or bought new ones, and went to work. Teams that lifted hard and heavy began to win national titles, and when professional teams began hiring strength coaches—all of whom came from Olympic lifting—the shift was complete.

Universals and other machines continued to be a part of the fitness industry and proved to be valuable in rehabbing, but the machine revolution seemed to have run its course. In order for an athlete in any sport to improve his strength considerably, he had to move black iron. It looked as if this was the way things would continue to be in strength training, but that didn't turn out to be the case.

The Tidal Wave

At the beginning of the '70s, a former Olympic lifter named Arthur Jones shook physical culture to its foundation. He was a visionary and businessman who came up with a unique design for exercise machines. But that was just a start. He also launched a marketing scheme that was simply overwhelming in relation to what had gone on before.

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Jones had already been very successful in several ventures in his life. He had flown planes across the Atlantic, led safaris in Africa and invented a camera that didn't vibrate so he could film the racing animals from a plane or fast-moving vehicle. He sold the footage he took to the very popular "Wild Kingdom" television show for many years, and the royalties he made from the camera and that show provided him with the capital to finance his newest venture: Nautilus machines.

He built the prototype while he was living in Africa so he would have some way to stay fit. Jones named his new machine after the shell of the chambered nautilus, a cephalopod found in the Pacific and Indian Oceans, because the rotating mechanism in each machine resembled that aquatic animal. Jones was extremely intelligent, and he was the consummate salesman. To state that he could sell refrigerators in the Arctic would not have been an exaggeration.

He revealed his invention for the first time at the 1970 Senior Nationals Olympic Championships and Mr. America Contest at the Veterans Memorial Auditorium in Culver City, California. It was on display in the lobby and looked

like something out of a science-fiction magazine. A mass of iron stretched almost 20 feet, with a station at each end—one for working the biceps and one for the triceps. This, he explained, was just for show. The actual machines were much smaller and separate from one another.

And when he told the crowd the cost of each machine, we all thought he was out of his mind. What gym owner, high school or college would lay out that kind of money for a machine that only did one exercise when he or she could purchase a half dozen 400-lb. Olympic sets for the same amount? None that I knew of, that was for sure. But we greatly underestimated Jones.

Not only had he created a unique product, but he also soon proved he was a marketing master. To prove how well this line of machines could improve strength and build amazing physiques, he told us to watch the upcoming Mr. America contest and keep our eyes on a 19-year-old from Louisiana, Casey Viator, who had been training exclusively on Nautilus equipment in preparation for this show.



In the mid-'60s, the plate stacks and cables of Universal equipment came to dominate weight rooms around North America.



Mike Harrington/Getty Images

As Universals gave way to Nautilus equipment and its knockoffs in the '70s and '80s, the fitness industry entered the true era of the machines.

While Chris Dickerson made history by becoming the first black Mr. America, it was Viator who blew the minds of everyone in attendance that night, including me. He absolutely stole the show, coming in third in the voting for Mr. America, third in the most-muscular division, and first in the categories for best arms, back and chest.

Immediately after Viator's stunning performance, magazines were filled with the story of how he achieved such remarkable results in such a short span of time. This became known as "the Colorado Experiment." The articles show Viator before he embarked on the program Jones designed for him, and he looked as if he had just gotten over a long illness. He showed little in the way of muscles and had a sad posture. The "after" photo revealed an unbelievable transformation. Within just 30 days of using the Nautilus exclusively and not taking any steroids, he appeared as he did on the stage in Culver City.

The following year, in York, Pennsylvania, Viator became the youngest Mr. America ever, and sales for the machines soared. Although Jones wanted to capture a big slice of the bodybuilding and weightlifting market, he also

wanted a piece of fitness market. To do so, he came up with a scheme that was very creative. He married his new machines to a program that could be done in a short period of time: 2 sets to limit on a battery of machines. For the first couple of weeks, members merely learned how to use the machines. After that, they were pushed to max at every workout. They left the gyms with weak knees and some nausea. This had never happened before, and they liked the sensation. It meant they were working extra hard, and that meant fast results.

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Gym owners began clamoring for the machines, especially those for the arms and chest. But Jones wasn't in any hurry. He had a long-range plan. If someone wanted to buy Nautilus, they had to purchase the entire line. And when a prospective buyer did that, he had the right to be a franchised Nautilus facility; that is, if they were willing to pay a yearly fee. His manufacturing plant in western North Carolina couldn't make machines fast enough to meet the demand.

Next, he turned his attention to professional sports teams, primarily focusing on football. He would invite coaches and owners of teams to his headquarters in Lakeland, Florida, take them on a tour of the facilities and wow them with his knowledge of kinesiology, applied anatomy engineering and biomechanics. He spoke with such confidence and fluidity that they went away stunned and greatly impressed.

Soon thereafter, rows of Nautilus machines could be found in training camps and sports complexes for NFL teams. Then Jones stood back and watched the trickledown effect take its course in universities and high schools all across the country. The consensus in the football community was, "If the pros are doing it, it must work."

The '70s belonged to Nautilus. Even Olympic lifters such as Ken Patera and top bodybuilders such as Robby Robinson,

Gary Leonard and Sergio Olivia used the machines. However, they didn't use them for very long. What they all discovered was they lost strength when they did the Nautilus routine. Lifters found the Nautilus machines just didn't work the tendons and ligaments like free weights did, and they were not able to maintain or gain strength with the machines. Isolation exercises on machines were simply no substitute for compound movements when it came to strength.

There was also confusion as to what Viator had really done. For his entire life, Viator had to respond to questions about whether he did extra work outside Jones' program, whether he had used steroids while on the program, and whether his weight was artificially low at the program's start due to a tetanus infection.

When Viator came to York to take part in the Mr. America Contest in 1971, I had left the employ of the York Barbell and started my own magazine, *Weightlifting Journal*. In my editorials, I had blasted Hoffman and John Terpak for the way I believed they had negatively affected Olympic lifting, so I didn't go to the contest because I knew I wasn't welcome. Viator drove out to Thomasville, where I was living in a brick farmhouse built in the 1800s. He wanted to thank me for running an article on him in *Strength & Health*. It was the first one ever done about him, and he believed it really helped advance his career. Curious, I asked him about the Colorado Experiment. Did he only use the Nautilus routine?

Viator told me that he did, indeed, do the program Jones gave him at every workout, but Viator told me Jones didn't know he slipped out at night, went to the Denver Y and went through a complete session with the weights. However, Viator publicly denied this claim in at least one interview, saying he only did what Jones prescribed. He passed away in 2013, leaving a lot of confusion about the exact details of the program.

Whatever had really happened, Viator claimed to have gotten unbelievable results from the Colorado Experiment, yet other lifters were unable to duplicate those results.

The New Renaissance

By the mid-'80s, Nautilus equipment went the way of Universals. They were sold or moved to storage or given away to high schools or community centers. Yet the machine revolution didn't go away. It just changed its face. Newer types of machines appeared on the market,



Dado Goldieri/Bloomberg via Getty Images

"Weight rooms are no longer designed with productivity in mind." —Bill Starr

announcing that they were more efficient and brought better results than any of those that had come before them. There were newly designed machines with stacks, and some to which Olympic plates could be added to increase resistance.

There was a line of machines that operated with air pressure, thus eliminating all forms of plates and stacks. The trouble with them was they kept breaking down and someone had to be called in from the company to re-hook the connections.

Across the country, new fitness facilities began to open up that not only had free weights and machines but also indoor swimming pools, basketball and racquetball courts, aerobic and yoga classes, plus snack bars and regular social events. The fitness centers were doing what YMCAs had been doing for years, but on a larger economic scale.

Some of these upscale health and fitness centers had rows and rows of machines. And they didn't restrict themselves to just one brand. To be competitive, they installed several lines of machines so members could have a wide range to choose from.

That hasn't changed, and I doubt if it ever will. Machines are deeply immersed in the fitness movement, as they are in the sports world. One of the biggest markets for machines is colleges and universities. Weight rooms are no longer designed with productivity in mind. They are designed for recruiting. The more equipment the coaches can show a prospective recruit, the better. It's big business, and I know of many universities laying out a quarter of a million dollars on new weight rooms in an attempt to break into the upper echelons of collegiate sports.

So where does that leave free weights? While it's true barbells and dumbbells often take a back seat to using machines in strength training, this is not always the case. Many strength coaches fully understand their athletes can get much stronger by using the free weights than they can by exercising on machines.

Why? Using barbells and dumbbells forces the tendons and ligaments to get more involved. When an exercise is done on a machine, those attachments receive very little



Richard Hernandez

The appeal of machine training is fading in some areas, sending athletes in search of CrossFit gyms and garages stacked with barbells and bumpers.

attention. Those attachments, not the muscles, are the source of pure strength, and therefore free weights are more beneficial to anyone wanting to get considerably stronger. For fitness and rehabbing, machines are great, but to get really strong, free weights are the way to go.

CrossFit has done a remarkable job in making coaches and athletes aware of the benefits of training with free weights.

However, fans of free weights need not be distraught. The future's looking bright for strength training because a movement is slowly but steadily bringing high-skill lifts done with barbells back into the mainstream. CrossFit has done a remarkable job in making coaches and athletes aware of the benefits of training with free weights. The movement is spreading, and hopefully CrossFit will lead the way and encourage all athletes to train on barbells instead of machines.



About the Author

Bill Starr coached at the 1968 Olympics in Mexico City, the 1970 Olympic Weightlifting World Championship in Columbus, Ohio, and the 1975 World Powerlifting Championships in Birmingham, England. He was selected as head coach of the 1969 team that competed in the Tournament of Americas in Mayaguez, Puerto Rico, where the United States won the team title, making him the first active lifter to be head coach of an international Olympic weightlifting team. Starr is the author of the books "The Strongest Shall Survive: Strength Training for Football" and "Defying Gravity," which can be found at [The Aasgaard Company Bookstore](#).