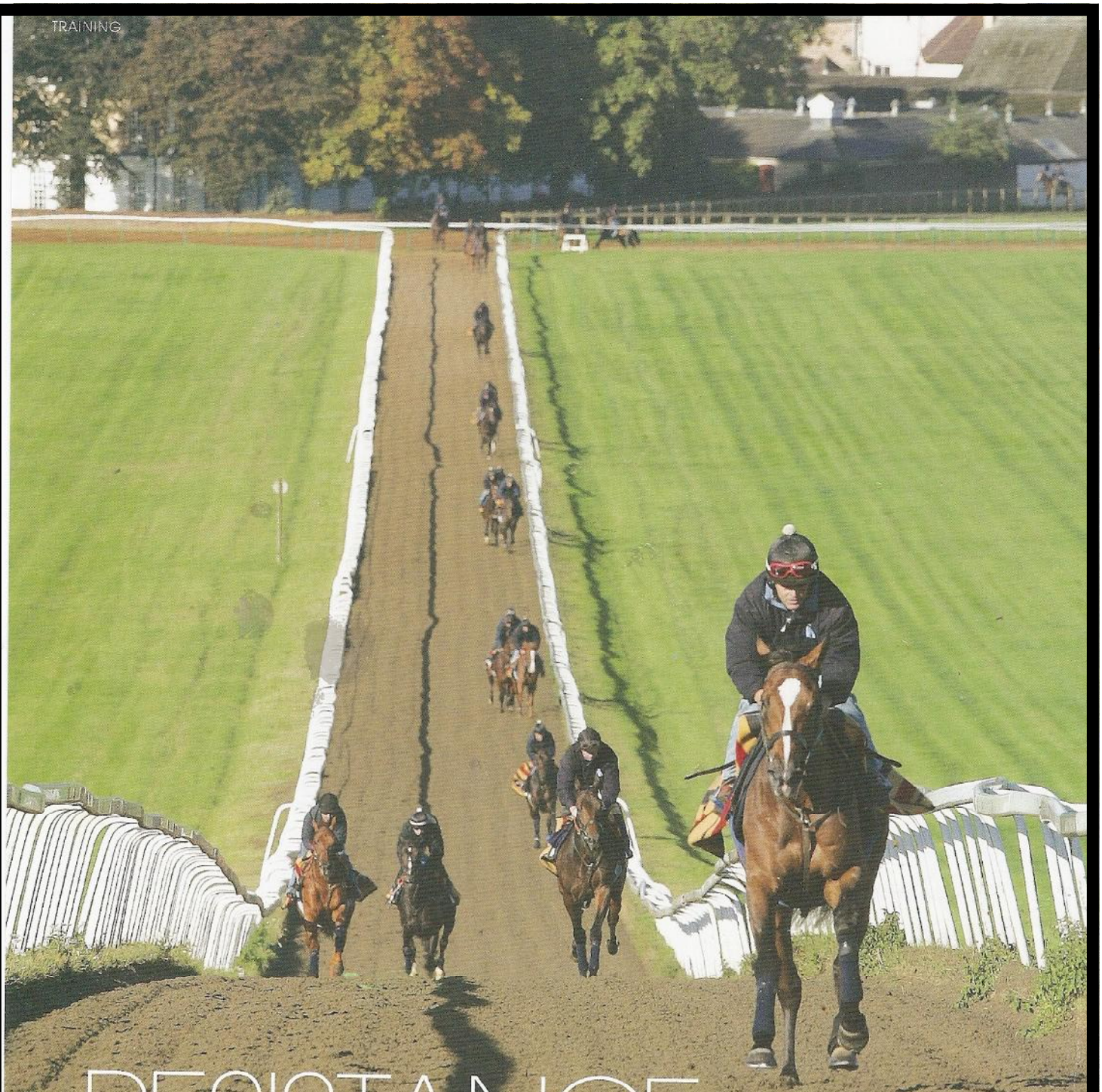

RESISTANCE TRAINING

By Caton Bredar

The term alone, "resistance training," invites at the very least skepticism, and in some cases, even a trace of joviality. As Hall of Fame conditioner Dick Mandella remarked when asked about it, "I'm very familiar with resistance training. For many years, I've had owners who resisted my training. I've had a few horses who resisted, too."

As he is known to do, Mandella was joking. But as he, and most in the Thoroughbred industry would attest, finding safer ways to train and develop racehorses is no joking matter.

While lacking in research and data, at a basic level resistance training is a tool some equine conditioners - including Mandella - are incorporating at least on a small scale into their training systems. At a very sophisticated level, a few horsemen are taking the idea of resistance training very seriously.

It's a type of exercise not without misunderstandings. Even in the training of human athletes, where resistance training arguably originated, there's some confusion.

Wikipedia defines resistance training as having "two different, sometimes confused meanings."

The broadest definition, according to the on-line encyclopedia, is any technique that "uses a resistance to the force of muscular contraction (better termed strength training)". In this sense, weight lifting is a basic form of resistance training with the weights offering resistance in direct opposition to the contraction of the muscle or muscles.

The second, more specific, definition refers to elastic or hydraulic resistance, or any type of training in which external devices -- such as resistance bands or exercise machines, are used to create the opposing force. In the case of horses, think underwater treadmill.

The American Sports Medicine Institute elaborates on the goal of resistance training, again in human terms, as: "gradually and progressively overload(ing) the muscular-skeletal system so it gets stronger."

A stronger muscle and skeletal system may well be the goal for any type of athlete. But when the athlete is four-legged, and already loading hundreds of pounds of pressure on a relatively smaller and decidedly more fragile bone structure, the problem gets increasingly complex. Take sports injuries in human athletes and multiply them four-fold.

That type of paradox - developing bigger, stronger, more durable racehorses while not breaking them down in the process - has already led some of the biggest names in harness racing to resistance training.

Training horses on a hill is an example of resistance training.

Joe Geiser, CEO of a company called Racehorse Conditioning Systems, is a proponent of resistance training and specifically, resistance carts. According to Geiser, resistance carts have been used for decades in Europe, with "thousands" of the carts in use there today. Perhaps even more noteworthy, in the United States, more than a third of the winners over the past 20 years of the Hambletonian and Hambletonian Oaks - harness racing's version of the Kentucky Derby and Oaks - have been trained using a particular type of resistance cart that Geiser markets and sells.

The theory is admittedly complex. On his website, Geiser points to several types of muscle fibers, including slow twitch, or aerobic muscle fibers, and fast twitch, or anaerobic fibers. The aerobic fibers are fueled by oxygen, the anaerobic fibers by glycogen. Anything needing a short burst of explosive energy, Geiser writes, requires fast twitch, or anaerobic muscle fiber. Resistance training works to target the anaerobic muscle fiber, but when combined with variations in speed and resistance, can also serve to impact the aerobic muscle fiber. When done properly, so that the glycogen supplies are depleted and then built back up again, the muscle learns how to produce and store more, which ultimately builds endurance.

Essentially, using a resistance cart is "basically like training a horse on a hill," says Geiser, "and you determine the length and steepness of the hill."

Geiser describes the resistance carts as slightly heavier jog carts equipped with two hydraulic pumps, one on each wheel of the cart, that in theory allow a trainer to increase the horse's workload and/or heart rate, while decreasing the amount of speed involved. When the trainer depresses a pedal, pressure on the wheel is released, so the horse has to pull - or work - more, even if he's actually slowing down or traveling at a walk.

"The horse doesn't feel the heavier cart, because it's balanced," Geiser says. "You control the amount of resistance and for how long you apply the resistance. The resistance itself is against the wheels," rather than directly against a horse's joints. Muscle groups, in essence, get a workout, without any unnecessary or added wear and tear on the skeletal system.

The majority if not all of the work

The new equine resistance training concept - Cyclone Theory - is based on the Parachute Technique pictured above

Joe Geiser with a resistance cart

on resistance carts is done at a walk, also reducing the potential for injury, according to Geiser. It's done in conjunction with a heart monitor, a key component of the entire program. "The key to the warehouse is the heart monitor."

A Pennsylvania resident, Geiser has trained and owned Standardbred horses on and off for the past six years. He advocates a system of training that also includes a very specific feeding program, ample recovery time between workouts, meticulous record-keeping, and a knowledge of the horse's maximum heart rate. He also stresses the importance of a positive attitude, and claims for the horses he has worked directly with, resistance training has almost always led to a healthier horse with a more willing spirit during workouts.

That positive attitude extends to Allentown, a 6-year-old gelded pacer Geiser has been working with, primarily using a resistance cart.

"Allentown has bad knees. Conventional wisdom told me to get rid of the horse," he offers. "I laid him up for five months, did a lot of walking with him. He went out every four days."

With ample recovery time in between resistance cart sessions and a minimum of traditional training - never at an all-out or extreme speed, Allentown returned to the races to record a fifth, a third, two seconds and two wins in six starts, including a win in January of this year.

"Fundamentally, the system is pretty easy to use," he adds. "But it's also easy to over-use and a trainer has to have a lot of patience."

Besides developing a better racehorse over-all, Geiser believes "this is about taking the cheaper horse and getting him to be productive," a principle he thinks could well be adapted to the Thoroughbred racing world.

"I know it's sacrilegious to consider a Thoroughbred pulling a cart," he says. "But there is some value holistically to teaching a horse to pull a cart."

The famed Thoroughbred conditioner Preston Burch might agree. First published in 1953, his "Training Thoroughbred Horses" is still considered among horsemen a reliable overview of the fundamentals of training. Burch writes, "Some trainers have their yearlings broken to harness before they are broken to ride. This is an excellent idea because it accustoms the yearling to bridle and teaches him to handle himself before weight is put on his back."

In principle, Leonie Seesing, owner and founder of the company Equi-Gym, also agrees. Now based in Kentucky, Seesing may be one of the first licensed Thoroughbred trainers in America, by Geiser's estimate, to purchase a resistance cart. A member of the Association of Equine Sports Medicine, Seesing started in Wyoming working as a jockey, owner and trainer before devoting herself to developing an alternative method of training.

"I saw these wonderful, beautiful horses going by the wayside," she claims. "I believed there had to be a better way."

With very little research to turn to, Seesing looked to human conditioning for inspiration, and says she also was influenced by progressive training "guru" Tom Ivers.

"Thinking out of the box, I tried to stop thinking about what we know about racehorses," and turned to what she could learn about humans, who, according to Seesing, adapt and respond to exercise in

much the same way equines do.

"When I started looking at humans," she says, "I started becoming much more innovative, and I found it worked. The end result was that they race a whole lot better."

Since 1983, Seesing has been a practitioner of progressive training, a form of training she describes as a combination of interval and resistance training, with the goal of increasing heart-rate while lowering impact.

"By going into the anaerobic system and progressively loading your exercise program," she says, "you build the body stronger."

"There's a benefit" to resistance training alone, she says, "but it's not as great. And for the amount of effort involved, it's kind of foolish...you're missing the most powerful part of training. With interval training, [the horses] become tough."

Similar to Geiser, Seesing believes in the need to "get inside a horse's head," along with thorough record-keeping, heart-rate monitoring, and a greater understanding of equine physiology.

"Resistance training can be a pretty good-sized tool, used throughout and done with high intensity at the end of a training program. It teaches the anaerobic system to become more fuel efficient."

Seesing finds uphill treadmills and resistance carts to be the most effective means of anaerobic, or resistance, conditioning, and, also similarly to Geiser, believes the greatest benefit may be for the lesser horses.

"Junk horses," she says in describing the majority of the horses she has owned or trained, but points as well to her success rate at getting horses to the races over a five year period - 94 percent, according to her calculations, well above the national average and an indicator that her program is working.

"The majority of trainers have horses like mine," she concludes. "When you use unconventional methods, you make more money, and you do better."

"Learning good physiology skills... how to manipulate the body. It takes work to learn," she adds. "There is so much more to it. It is overwhelming. But there are a lot of people who are tired of trashing their horses."

Noted Veterinary Surgeon and Director of Orthopedic Research at Colorado State University, Dr. Wayne McIlwraith stops short of endorsing interval training or putting a cart behind a Thoroughbred, but he does see some potential in resistance training.

"How a horse lands in his stride is innate. It can't be changed much. But a lot could be mitigated potentially, with resistance training."

McIlwraith agrees about the importance of muscle fiber. "Muscle tone is certainly critical," he continues. "The more fit they are, the more stable the joint, the less disease. It does come back to muscle."

"There's a lot of logic to it," he concludes, while admitting the research is limited. "If you can stimulate muscle without wear and tear...if you could train slowly and without impact on the joints... it would absolutely be safer. There's always potential, but I haven't seen any data."

McIlwraith is credited on the website of a relatively new equine resistance training concept called "Cyclone Theory." Patterned after a new human training concept called "parachute technique" - in which wind resistance is created by a parachute attached to an athlete's waist as he or she sprints - the theory as described on their website is that wind resistance is transferred to the legs and applied to all the muscles directly involved in moving the body forward, so higher power at high speeds is ultimately achieved. In the case of Thoroughbreds, the resistance is created by a band stretched consistently and horizontally from the horse, and controlled by the pace with which the horse travels.

"The two things that hurt horses," says McIlwraith, "are weight and speed." Anything that reduces those two factors, he says, is worth exploring.

Which brings us back to Mandella. Known, in particular, for his success with older horses like top turf performer Sandpit or, more recently, The Tin Man, Mandella says over the years he's used an underwater treadmill for horses returning from injuries and/or long lay-offs, as an intermediate step prior to returning to the racetrack.

That time period, the time between walking and jogging or galloping, according to McIlwraith, is critical.

"Resuming training is a big transition," he says. "It's always a difficult transition going from walking to galloping, when rehabbing from an injury. Anything that can make it not as big a shock is beneficial."

"IT'S A TRADITION-LADEN SPORT, AND THERE'S GOING TO BE A CERTAIN AMOUNT OF SCEPTICISM ABOUT MANY THINGS. BUT THINGS ARE CHANGING."

About a year ago, with the advice of his veterinarians, Mandella added a device called the Astride to his program, as a way of transitioning some horses between minor injuries and their return to the racetrack.

"We've been kind of experimenting," he says of the device, which allows varying amounts of weight to be deposited in saddlebags on either side of the horse. The weights are secured to a surcingle or belt girthed around the horse's barrel, then attached via reins to a headstall and bit.

"We use it for horses you can't really train - maybe they've grabbed a quarter," Mandella elaborates. "You vary or increase the weight. It keeps you from going backwards."

Mandella uses the device on horses standing in the stall or walking around the barn and cautions that it's not a replacement for regular training, but rather an effective stop-gap measure. "We're finding it just works better with weight," he concludes, something other trainers, by McIlwraith's estimation, are discovering as well.

"Anything that's putting on increased muscle...without increasing risk. Bottom line, there are a number of ways to try and accomplish that. It's a tradition-laden sport," McIlwraith admits, "and there's going to be a certain amount of skepticism about many things. But things are changing. We surely have to find a better way than we do it now."

"People are looking at different ways," McIlwraith proclaims. "Of course that doesn't mean there are better ways. But people are trying to find a better way."

And as to whether resistance training is that better way, "there are many subjective feelings...now we have to work on proving them."