



No Winning Through Witchcraft Here

The highly sophisticated Coto Research Center reflects Dr. Gideon Ariel's lifelong fascination with the science of athletic performance



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In this article, Pamela King explores the work of Dr. Gideon Ariel, a former Israeli Olympian and founder of the Coto Research Center. Ariel, who holds doctorates in exercise science and computer science, uses his expertise to analyze and improve athletic performance. His research center, equipped with advanced technology and exercise equipment, is dedicated to the study of biomechanics. Ariel's system involves capturing an athlete's motion in detail, then using a computer to analyze aspects like speed, center of gravity, and strength. The data is then interpreted to suggest improvements.

Ariel's clientele includes professional athletes and Olympians, who pay a hefty sum for his services. However, Ariel also generously donates his time and resources to amateur athletes. His other ventures include the invention of a computerized exerciser that memorizes an individual's workout and offers day-to-day feedback. Ariel also tests sports equipment for corporations and maintains that the most important component in sports is the person using the equipment. Despite his success, Ariel leads a modest lifestyle and reinvests his earnings back into his business.

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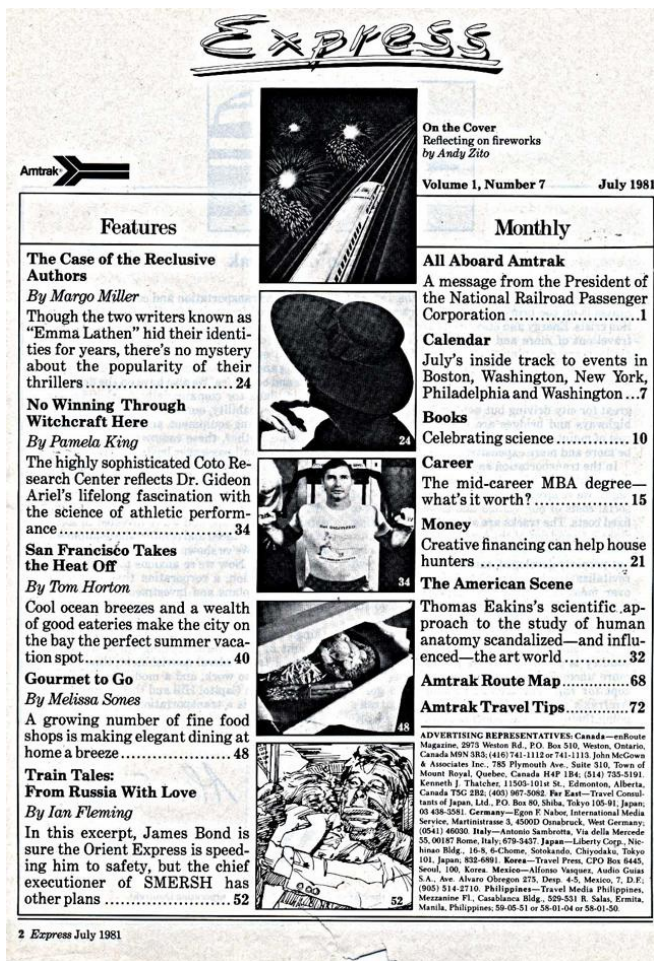
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JM
Coto Research Center
22000 Plano Rd.
Trabuco Canyon CA
92678

No Winning Through Witchcraft Here

The highly sophisticated Coto Research Center reflects Dr. Gideon Ariel's lifelong fascination with the science of athletic performance.

By Pamela King

If Gerald Ford kept his left arm a little straighter and rotated his hips a little more, he might now have a bright green Masters jacket among his memorabilia.

When Gideon Ariel analyzed Ford's golf swing, he discovered that a bowed elbow and lazy leg motion were the main factors that separated the former president from Jack Nicklaus. If Ford had had access to that information forty years ago, he might have spent his career battling Ben Hogan and Sam Snead instead of irksome Democrats and nagging reporters.

Ariel, a forty-two-year-old Israeli with doctorates in exercise science and computer science from the University of Massachusetts, is in the business of analyzing physical performance. He is founder and president of the Coto Research Center, a multimillion-dollar facility located in the wilds of Trabuco Canyon, about halfway between Los Angeles and San Diego.

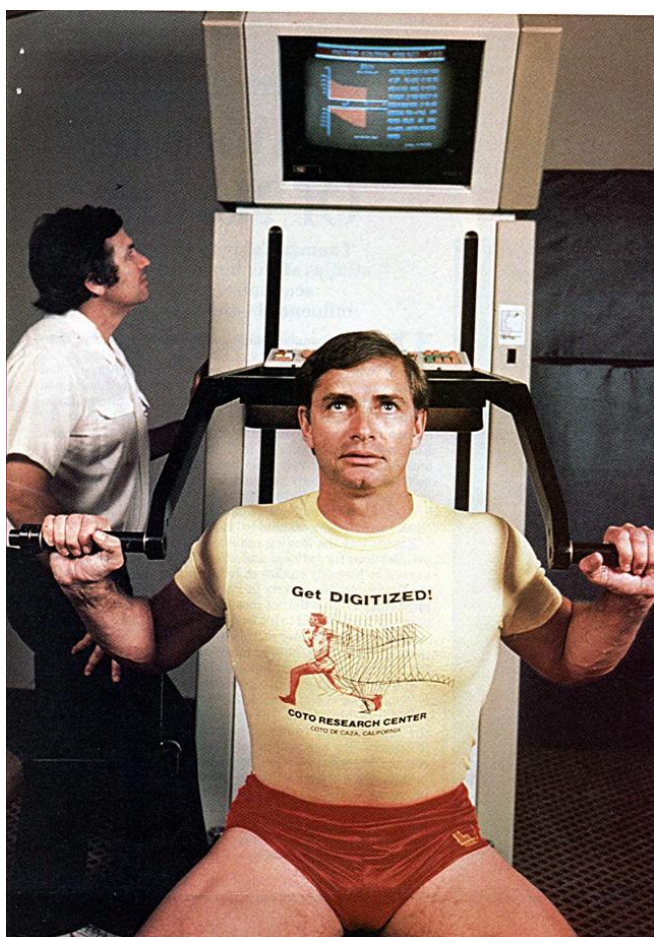
Along with the renowned Vic Braden Tennis College, the research center is tucked into a real estate development called Coto de Caza. Braden and Ariel are kindred spirits because of their fascination with the scientific basis of athletic performance, and the rotund tennis pro helped Ariel convince Coto de Caza's developer to build the research site.

Once supplied with a couple of buildings, a running track and a tennis court, Ariel proceeded to fill the rooms with computers and exercise equipment and to modify the court and

Dr. Gideon Ariel uses one of his computerized devices to gauge an athlete's strength.

Photo: David Strick

July 1981



"Ariel is now working on a model of the computerized exerciser that could be used at home, with an ordinary TV set."

track with specialized instruments.

The eight-month-old center is the culmination of a decade of pioneering work in the field of biomechanics. In this spacious and well-equipped locale, Ariel and his partner, Ann Penny, have expanded their research into human movement, which began in 1971 in a cramped office in Amherst, Massachusetts.

"I was frustrated that coaches were training athletes with witchcraft," says Ariel, who competed on the Israeli Olympics team in 1960 and 1964 as a shotputter and discus thrower. "It was all a lot of mumbo-jumbo—if the shot goes 190 feet, the coach says everything you do is right; if it goes 50 feet, everything is wrong."

"I wanted to know, 'What is the velocity of the arm?' I needed a way to quantify information. I did basic research into reaction time, reflexes; I studied mechanics, engineering, physiology."

Ariel ultimately found the solutions he sought in the university's computer center; after ten thousand hours, he developed programs that enabled him to translate arms and legs and twisting hips into "x" and "y" coordinates, ready to be plugged into equations. He and Penny borrowed \$5,000 to buy a computer and founded Computerized Biomechanical Analysis, Inc.; and although they have moved to Trabuco Canyon, CBA's research and development remains in Amherst.

In simplified terms, Ariel's system works this way: He projects a picture of an athlete on a screen and, with a penlike machine called a "digitizer," pinpoints the joints and marks lines between them; advancing a slow-motion film, he repeats this procedure in sequence for the athlete's entire swing or stride.

That information is banked in

the computer's memory, and the instrument then compiles data on every aspect of the athlete's motion—speed, center of gravity, acceleration and deceleration, strength, timing. It is Ariel's job to interpret the data and to calculate what the athlete can do to improve.

"What I learned at the Coto Research Center was different from what anyone else had told me," says Joe Abate, twenty-one, a placekicker on Harvard's football team. "He told me I needed to work on my strength, but that my form was good. I was really happy because he gave me an idea of what my problem is, and now I can work on it on my own."

Abate is motivated partially by the prospect of a professional football career if he is able to fulfill his potential; he is also spurred by the fact that his pilgrimage to Trabuco Canyon cost \$1,500—too large an investment to squander. Ariel charges that hefty sum per analysis, and if a tennis-playing patron wanted both his forearm and his backhand diagnosed, each stroke would be \$1,500. Throw in a serve and you're up to \$4,500.

At those prices, needless to say, the Coto Research Center isn't mobbed by weekend duffers and casual tennis players. So, considering that he generously donates time and resources to Olympic-caliber amateur athletes, how does Ariel keep the center financially solvent? It's easy. Ariel is a far cry from the proverbial absent-minded pro-

fessor. He is conspicuously practical and frugal, he is shrewd, he is a spectacular salesman. And he receives a steady and comfortable income from royalties from Nautilus and Universal exercise machines, of which he was a principal inventor.

Ironically, his newest invention may hopelessly antiquate both of those weight-lifting systems, which grace the hardwood floors of virtually every health club or gym in the country. He has developed a computerized exerciser that memorizes an individual's workout and offers feedback from day to day. It supplies extra resistance to build specific muscle groups; if an athlete is injured, it allows him to continue training by isolating the sore joint or muscle and releasing tension on it. If the athlete carries his workout on cassette, it is possible for him to use the machine anywhere in the world and pick up where he left off the day before. Major international hotel groups are considering installing the exercisers.

Ariel now is working on a model of the computerized exerciser that could be used at home, in conjunction with an ordinary television set; commands and feedback would be flashed on the TV screen. He believes the machines could be marketed, through a national corporation such as Radio Shack or Apple Computers, for little more than \$1,000 apiece.

Corporations pay Ariel and Penny to test their sports equipment—in fact, CBA's first contract, back in 1971, was to see whether Spaulding basketballs were bouncing and arching properly, which they were. They have tested running shoes, tennis rackets, golf clubs, tennis balls. Ariel's conclusion: the most important component is the person who's using them.

"It's like a gold-plated ignition key for a '48 Volkswagen," he says

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in his rich Israeli accent. "The golf club is only as good as the person swinging it."

Admitted workaholics, Ariel and Penny live within walking distance from the center. Even the computers know their habits: if either one signs onto a Megatac terminal after midnight, the machine flashes "Good Grief!" on its screen. They have little social life and gleefully pump every dollar they earn back into their business. "I suppose the business is worth about \$10 million," says the stocky Ariel, who favors jeans and open-neck shirts. "But you can eat only one steak and drive one car—and I happen to prefer Chevy."

Ariel's lifestyle may be modest, but he isn't coy about his abilities. He proudly displays laminated copies of magazine articles proclaiming him a genius and announces, without hesitation, that his is the most advanced sports research center in the world.

"They talk about East Germany," he says, scoffing at those who have created world champions through chemistry. "We are about two generations ahead."

To back up that statement, Ariel is uncommonly accommodating to American Olympic aspirants. "We don't even get a tax write-off," he boasts. "We just love the sports."

Russ Hodge, former world record holder in the decathlon, is sports program director at the research center. He develops specialized programs for Ariel's clients and, in his spare time, trains himself for an Olympic comeback. Using an Ariel analysis, the forty-one-year-old Hodge hopes to compensate for his diminished speed with more finesse.

The U.S. Olympic women's volleyball team also is in residence at Coto de Casa, where coach Arlie Selinger has constant access to Ariel's computers. "Our biomechanical analyses of spiking, serving and

passing are helping to confirm our thoughts," Selinger says. "We are reevaluating what we've been doing and changing some things, particularly our spiking."

World-class track-and-field athletes who have dropped in for diagnosis and pointers include discus throwers Al Oerter and Mac Wilkins and sprinter Evelyn Ashford.

"I predicted Ashford would get hurt a few weeks before it happened," Ariel says, referring to her devastating thigh injury of April 1980. "I had tested her on my force plate [a \$25,000 metal plate imbedded in his track, with a computer beneath it] and discovered that her horizontal force equaled her body weight. Running that way, she could not last."

For Oerter and Wilkins, Ariel diagnosed problems in form that were inhibiting their results. Wilkins's front leg was absorbing energy that should have been going into the toss, and Oerter was releasing the discus at an inefficient angle. Both have made the best throws of their illustrious careers since their sessions with Ariel.

Ariel rattles off an eclectic list of athletes he has digitized: Dallas Cowboys' tackle Rayfield Wright, the Kansas City Royals' pitching staff, a world Frisbee champion, the consecutive free-throw record holder, as well as Kentucky Derby winner Spectacular Bid. The horse's owners found Ariel's findings, concerning why "The Bid" was able to dominate the Thoroughbred world so totally, so intriguing that they have decided to keep them under wraps. Ariel is particularly confident of his ability to predict a great racehorse and maintains an interest in a stable in Florida.

If Gideon Ariel puts his money on a longshot, don't ask questions. Just follow suit—and you'll follow him to the cashier's window. □