



Computer whiz Gideon Ariel can help you do better

An angel of God appeared to a young Isaelite named Gideon.



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Gideon Ariel, a sports scientist, uses computerized biomechanical analysis to improve human performance. Ariel's work involves using high-speed cameras and computers to analyze the body's movements and suggest improvements. His work has been applied to a variety of fields, from athletics to music. Ariel's analysis has helped athletes like Mac Wilkins, a discus thrower, to improve their performance and break world records. Ariel's work has also been used to analyze the movements of racehorses and violinists. Ariel believes that his work can help to take the guesswork out of coaching and instruction, providing coaches with the tools to make the best athletes. Ariel is currently working on a computerized hydraulic exercise machine to help athletes reach their potential.

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Below find a reprint of the 7 relevant pages of the article "Computer whiz Gideon Ariel can help you do better" in "People Magazine":

HOW TO BEAT AN UNFAIR TRAFFIC TICKET
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Ethel Merman tries her pipes on disco
A doctor who treats doctors addicted to drugs and alcohol
That Iowa farmer the Pope will visit

Classy new ANGEL

Hello Shelley Hack, goodbye jiggle: an elegant model brings a Tiffany touch to Charlie's trio

People weekly



10227

September 24, 1979 Vol. 12, No. 13

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 Cover photograph: Courtesy ABC-TV

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ANYTHING YOU CAN DO, COMPUTER WHIZ GIDEON ARIEL CAN HELP YOU DO BETTER




Around 1100 B.C., the Bible recounts, an angel of God appeared to a young Israelite named Gideon. The Israelites were under the heel of the Midianites, and God had chosen Gideon to vanquish the foe. With a band of just 300 warriors, Gideon stole into the enemy camp by night and set off a barrage of bright lights and loud noises, creating the illusion of a vast army. In a panic, the Midianites fled.

Gideon Ariel is in the business of improving human performance, but even he would be hard-pressed to make any suggestions to his biblical namesake. In a way, this modern-day Gideon is a warrior, too, but his battlefield is the body and his foe its failure to live up to potential. His weapons are the toys of the electronic age—sonic pens, high-speed cameras and, of course, computers. "All I care about," he says, "is that all participants achieve their optimum."

To see that they do, Ariel has become the passionate promoter and lonely practitioner of something called Computerized Biomechanical Analysis. That's what the sign says over the shabby little storefront between Eric's Giant Subs and Shumway's Paints on a quiet street in Amherst, Mass. Clarifying only slightly, a sub-head on the sign explains, "Science serving industry, sports and human performance." "What Gideon has done," explains Dr. Conrad Wogrin, the matchmaker who brought Ariel and computers together 12 years ago at the University of Massachusetts, "is to treat the body much as an engineer would treat any kind of mechanism made up of links." Like a machine, the body requires that certain conditions

Photographs by Harry Benson

BIO [C.B.A. INC. - PERFORMANCE PROFILE] [JIMMY CONNORS... GERYE]



POSITION. VELOCITY. CORNER...

—even if you were pretty good to start with. When Mac Wilkins submitted to Arielization in 1975, he was already one of the best discus throwers in the world. Yet Gideon's computer printouts indicated that Wilkins' front leg was absorbing energy that could otherwise be utilized in his throw. Following Ariel's advice to alter his stride, Wilkins shattered the world record by nearly six feet, and went on to win the 1976 Olympic gold medal. The bad news for those who hope to challenge Ariel subscribes to the theory that anything you can do, you can do better

Ariel, the wizard of biomechanics, is framed by a photograph and computer printout of Jimmy Connors' leaping serve. Computer analysis shows Connors could hit the ball harder with his feet on the ground.

some 17 feet shy of his potential. According to Gideon, biomechanics can be applied to anything that moves, human or otherwise. Several years ago three investors were debating which of five race horses to buy, and took their dilemma to Ariel. Gideon filmed each of the horses with a high-speed camera, and subjected the films to computer analysis. Printouts

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COFFEE, COLA OR VIVARIN?

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BioCONTINUED

In hand, he picked out a filly. "We determined that this horse's center of gravity didn't change as she ran, and therefore she was biomechanically the most efficient," says Ariel. The owners accepted his recommendation, and the horse won several races without a defeat.

Although the uses of biomechanics may be most obvious in the field of athletics, says Ariel, his science's application ranges into the arts. Several years ago, master violinist Paul Zukofsky made a pilgrimage to Gideon's Amherst headquarters. Ariel offered suggestions on stance and arm movement. "Now," he claims extravagantly, "Paul can play music that he has never played before." Zukofsky laughs off the notion that Gideon transformed him from a musical weakling to the Charles Atlas of stringed instruments, but believes that Ariel's work has great potential for aiding violin teachers. "With his help," he says, "we have been able to formulate a description of what a violin bow stroke is. Until recently we had been teaching our students, 'You do this because this is how you do it.'"

One of his primary goals, Ariel explains, is to take the guesswork out of coaching and other forms of instruction. "This office cannot coach athletes," he concedes, "but we can provide coaches with the tools to make the best athletes." When the Dallas Cowboys came to Ariel two years ago to find out how to prepare for the tug of war in ABC's *Superstars* competition, he told them the secret lay in harnessing the power of the legs.



Former President Gerald Ford may be a 14-handicap golfer, but Ariel found that his swing was as powerful as Jack Nicklaus. Ford doesn't hit the ball as far, though, because his club isn't moving as quickly at the moment of impact.

"Coaches without this kind of information are like engineers without slide rules," he contends.

Rather than rely on a wish and a prayer, Ariel uses a camera that shoots up to 1,000 frames per second to analyze a blink-of-an-eye motion like Jimmy Connors' first serve. The film is then projected on a screen lined with 20,000 tiny directional microphones. Freezing the film, Ariel touches a point on the screen (Connors' elbow, for example) with a magnetically sensitive sonic pen. The coordinates of the point are fed into a computer, which then analyzes the physical components (velocity, acceleration, centers of gravity) involved at the instant the action was stopped. In Connors' case, Ariel found that the tennis ace's feet were leaving the ground at a crucial moment, diminishing the velocity of his serve by nearly 20 miles an hour. Connors recently began making adjustments, and his mother, Gloria, has written Gideon a letter of thanks.

A native Israeli, Ariel was devastated as a child by his parents' divorce. Afterward, at the age of 11, he was sent to a kibbutz by his father, an accountant, and his mother, who was secretary to the mayor of Tel Aviv. Ironically, physical education was Gideon's nemesis. "I was the slowest runner in the class," he recalls. "Even the girls beat me." Then, at 16, he encountered a teacher who fired him with purpose. "Somehow I related to this guy," he says, "and one day he gave me a book that showed how exercise could make your body look nice." From that

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Ariel pumps iron every day in his living room on the Universal exercise machine he helped develop in 1972.

BioCONTINUED

moment on, Ariel was obsessed with exercise. "When I want something," he explains, "there is nothing else in life until I accomplish it."

Before leaving the kibbutz, Gideon vowed to become an Olympic champion in the discus. It was an arbitrary choice—he had never seen a discus thrown—but he pursued it with characteristic intensity, training eight hours a day according to a regimen he set out for himself. Later, at school, north of Tel Aviv, he received his first professional coaching, and set an Israeli discus record. At the 1960 Olympics in Rome, however, he found himself physically overmatched ("Genetically I wasn't cut out to be an Olympic champion") and utterly distracted by the world beyond Israel. Still, he was offered an athletic scholarship to the University of Wyoming. "The man tells me he is coach of the highest university in the U.S.," remembers Gideon. "I thought he meant academically, but it was altitude he was talking about."

Ariel put in his three years of compulsory military service in Israel, then headed for Wyoming in 1963. He spoke no English, had never seen television,

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BioCONTINUED

and was baffled by American football. "I saw the players for the first time and didn't know they wore shoulder pads," he remembers. "I thought these Americans were monsters." Despite the confusion, he flourished both academically and athletically. After graduation he enrolled briefly in medical school. "But after one semester," he says, "I decided I like to deal with health, not disease." Moving on to the University of Massachusetts, Gideon obtained a master's degree in exercise science in only nine months, then began work on his doctorate. In 1967 he met Dr. Wogrin's computers. "I got very excited," Gideon recalls. "I hate memorizing and this machine could do it for me. I started taking every course in computer science I could think of." When professors refused to credit the courses toward his degree, Ariel decided to go for two doctorates simultaneously—one in computers, the other in exercise science. "Dr. Wogrin told me, 'You are the first one who can quantify human movement.'"

Gideon says, "He said, 'Keep going. It won't be easy. But you are going to revolutionize the field.'"

Though Ariel had been married in 1963 to an Israeli dancer and model named Yael, the relationship was doomed from the start. "It failed because I'm all day working," he says. "Family for me was never a success story." Now remarried, Yael lives in California with Gideon's only child, Geffen Olympia, 14. Ariel's current girlfriend is Dr. Ann Penny, 35, a fellow computerphile who serves as president of CBA while he devotes himself to research and innovation. She harbors no illusions about Gideon's priorities. "His work is his life, his love," she observes with a sigh, "and I'm the same way. We never socialize." Each puts in up to 20-hour days at the laboratory, and diversion is limited to an afternoon run (five miles for him, 10 for her) and workouts at their tiny bungalow on nearby Lake Metacomb. Though CBA is worth an estimated \$5 million, they live modestly on Ann's \$2,500-a-month salary, while Gideon, the sole stockholder, plows all his own money back into the company.

Next year Ariel and Penny will move to Coto de Caza, Calif., where he and Braden are planning to open a sports research center offering a wide variety of biomechanical services, ranging from physical rehabilitation to individual athletic instruction. If a frustrated

golfer, for instance, is anxious to add length to his tee shots, Ariel and Braden will be pleased to oblige. "If he doesn't increase his drive by, say, 15 yards," vows Gideon, "he won't pay. If he does, he pays about \$1,500."

To help athletes arrive at their hidden potentials, Gideon is currently working on a computerized hydraulic exercise machine—similar in some respects to the Nautilus, which Ariel says he also helped develop—to be distributed by Wilson Sporting Goods. Meanwhile, Data General, the computer manufacturer, has donated equipment similar to Ariel's to the U.S. Olympic Committee, with the proviso that Gideon be in charge of its programming. Though Ariel cynically refers to the Games as the "pharmaceutical Olympics" ("The main thing now is how to take drugs and not get detected"), he plans to demonstrate once and for all that the key to better performance is biomechanics. To prove his point, he is working with four-time Olympic discus champ Al Oerter, 42, on his improbable quest for a fifth gold medal. "Physical deterioration," announces Gideon, his eyes sparkling with the gleam of a visionary, "will be overcome with scientific advance." JUDY KESSLER

For roommate and fellow workaholic Ann Penny, life with Ariel is not fun and games. "The business is our hobby," she says.

