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U.S. Olympic Committee's Secret Weapon: Biomechanics

The U.S. Olympic Committee is investing heavily in the science of biomechanics, a secret weapon that could put the U.S. team years ahead of its competitors. The budget for the 1984 games is over \$71 million, almost five times the amount spent on the 1976 games.

Dr. Gideon Ariel, an Israeli-born computer science expert, has refined and perfected the use of biomechanics in training athletes. The process involves taking several hours to set up a sequence of motion pictures, transferring frame-by-frame the angle of each joint from the film to the computer, and finding errors that cannot be seen by the camera or the human eye alone.

This technique has already shown promising results. For instance, Al Order, a four-time Olympic gold medalist in discus, was able to improve his technique and throw the discus further than ever before after his technique was processed by the biomechanics computer.







The biomechanics computer is also being used to analyze the performance of competitors, helping the U.S. team learn from their techniques. The U.S. women's volleyball team, for example, has already benefited from the analysis of the Japanese champions.

Olympic athletes will continue to work intensively with the biomechanics laboratory in preparation for the 1984 games.

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Audio transcription

Frame	#	Time	Spoken text
	0.	00:00:00	Games are held every four years but to the athletes that quadrennial event is a matter of just about
	1.	00:00:05	perennial preparation. And these days, as Harold Downell reports from the U.S. Olympic Committee
	2.	00:00:10	National Training Center, the stopwatch and tape measure are supplemented by the computer.
	3.	00:00:19	It's almost as if the United States Olympic Committee is preparing for war, not games in 1984.
	4.	00:00:25	The budget is more than \$71 million, almost five times the amount spent on the 1976 games,
	5.	00:00:31	and they will make maximum use of what they call their secret weapon. The science of biomechanics
	6.	00:00:37	is not new in itself, but as refined and perfected by Dr. Gideon Ariel, an Israeli-born computer

Frame	#	Time	Spoken text
	7.	00:00:42	science expert, it puts the U.S. team years ahead of its competitors. I think we've got the secret
	8.	00:00:48	weapon here and we're going to beat these Germans and the Russians. It is a painstaking process,
	9.	00:00:54	taking several hours to set up a sequence of motion pictures, transferring frame-by-frame the
	10.	00:00:58	angle of each joint from the ankle to the elbow, from the film to the computer, finding errors
	11.	00:01:04	that cannot be seen by the camera or the human eye alone. AI order has won four Olympic gold
	12.	00:01:09	medals during the discus. He has set six world records. This is also AI order after his technique
	13.	00:01:15	was processed by the biomechanics computer, which not only showed him what he was doing wrong,
	14.	00:01:20	but also told him exactly how to throw the discus further than anyone has ever thrown it before.
	15.	00:01:25	He was able to throw on the computer 250 feet. This is over 10, almost 20 feet, 18 feet,
	16.	00:01:32	better than the world record. He has it in his body, the motor got it. Now we have to tune it.
	17.	00:01:37	It's a matter of tuning. I think the results show that I am showing better. I don't think I'm throwing
	18.	00:01:44	to my potential. I know the computer says I should be throwing around 250. Now whether it
	19.	00:01:51	can throw 250, not as something that's up here. But the analysis is telling me how to work more
	20.	00:01:58	productive. Not only is the biomechanics computer being used to analyze the performance of American
	21.	00:02:04	athletes, it's also a tool to determine if the competition has any secrets the team ought to know.
	22.	00:02:09	One thing for sure, the East German and the Russians and the best athletes in the world will
	23.	00:02:13	not be able to keep what hypothetically calls secrets from our sport medicine program because
	24.	00:02:20	we will analyze them and we'll know what they're doing. And if they're doing better, we'll learn
	25.	00:02:24	how to do it even better than them. The US women's volleyball team has already benefited,
	26.	00:02:28	working with the analysis of the Japanese champions. A few years ago, this team wasn't even considered
	27.	00:02:34	competitive. Now it's one of the top rated in the world. Olympic athletes will be coming here
	28.	00:02:38	for intensive work with the biomechanics laboratory between now and the 1984 games.
	29.	00:02:43	That's when they'll find out for sure if the secret weapon really works.
	30.	00:02:47	Harold Dow, CBS News, Colorado Springs.

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