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## The Olympics and Performance Enhancement

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As has been the custom over the last several decades the Olympic games, and the trials, were plagued by drug scandals and disqualifications. Throw in a few accusations of illegal substance use and you have the international athletics scene in a nutshell. Three British athletes were sent home for drug violations which occurred before the games, a Chinese woman volleyball player and a Russian woman marathon runner were disqualified for use of stimulants, two Americans, a male hammer thrower and a female shot putter were disqualified for use of anabolic steroids, and countless others were disqualified before the games began. Last year 34 athletes were disciplined for drug violations, and the year before the number was 28.

What all of these athletes were looking for was that illusive winning edge. In events where the margins of victory are as small as one-hundredth of second, even the smallest advantage can be the difference between gold and bronze, or no medal at all. And the difference between gold and anything else is often measured in the millions of dollars worth of endorsements, incentive monies, and numerous other rewards.

The winning edge, that small margin, is what drives the athletes not only to drugs, but also to the science and technology of victory: A technology in which the athlete becomes an object, a piece of meat, and a machine to be fine-tuned for victory.

The area of greatest advance in athletics over the past few decades has not just been the appearance of the bigger and faster athlete, it has been the coming of high technology to sport. Science has been applied to the athletes and their equipment to develop a more perfect athletic machine. An artificial factor is introduced to change the human equation. How this differs from the application of pharmaceuticals to the athlete might be more of a distinction than a difference.

Three areas of sport science have expanded in the last few decades: physiology, biomechanics, and psychology.

In the area of physiology the major scientific studies have centered on the physiological reactions to performance. What are the rates of heart and respiration? What are the levels of lactic acids, how can they be controlled, and what is their impact on performance? What determines oxygen use and retention? How does diet relate to these matters? What is the significance

of body fat and what is the most efficient means of controlling it? All of these are measured and studied with high tech equipment. Then the data is put into the computers and analyzed ad nauseam. All in pursuit of the winning edge.

Biomechanics may be the most significant area of advance. The focus is body motion, efficiency of motion, and the effect of stress on motion. Athletes are recorded in action by high-speed cameras which can break down movement to the hundredth and thousandth of a second. Body movement is analyzed in training and in competition. The effects of the stress are analyzed, the athlete is shown what is happening, and then learns to control these effects. Computer imaging is used to study all aspects of muscle movement and body motion to find maximum efficiencies, for maximum result. Techniques of performance have been changed to cut those hundredths of a second off the times of competition. All of these developments have had a major impact on training technique.

Biomechanical science has been instrumental in equipment changes. This is seen most obviously in the proliferation of athletic shoes for all possible functions, and in all sorts of other equipment changes involving materials, aerodynamics, and the harmony between equipment and the human body. Again it's those hundredths of a second that are stake.

Then there is sports psychology, the voodoo of modern sport. If an athlete from a third world nation had arrived in Barcelona with a medicine man, the Western media would snicker and NBC would have presented a cute up close and personal on it. But when world class athletes arrive at competition with their sports psychologists in tow it hardly causes a stir. Such terms as "imaging" and "visualizing" have become part of the sports scene, even though no one really has any scientific evidence analyzing the relationship of mind to body. While everyone has some gimmick or another that seems to help the athlete maximize performance and cut those precious hundredths of a second off the clock and produce the winning edge.

It is clear that all of this science and technology is imposed on the athlete from the outside, no matter the physiological or psychological cost to the individual. It is hard for me to accept the notion that these techniques are any less artificial than the use of drugs to enhance performance. And in some cases it is clear that the dangers to human health, both physical and mental, can be as great as those from drugs. Yet these areas of

science and technology are accepted as part of the quest for excellence, victory, and the gold, while drugs are not.

I'm not sure why.

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