

DRUGSTORE ATHLETE

To beat the competition, first you have to beat the drugs

BY MALCOLM GLADWELL

At the age of twelve, Christiane Knacke-Sommer was plucked from a small town in Saxony to train with the elite SC Dynamo swim club, in East Berlin. After two years of steady progress, she was given regular injections and daily doses of small baby-blue pills, which she was required to take in the presence of a trainer. Within weeks, her arms and shoulders began to thicken. She developed severe acne. Her pubic hair began to spread over her abdomen. Her libido soared out of control. Her voice turned gruff. And her performance in the pool began to improve dramatically, culminating in a bronze medal in the hundred-metre butterfly at the 1980 Moscow Olympics. But then the Wall fell and the truth emerged about those little blue pills. In a new book about the East German sports establishment, "Faust's Gold," Steven Ungerleider recounts the moment in 1998 when Knacke-Sommer testified in Berlin at the trial of her former coaches and doctors:

"Did defendant Gläser or defendant Binus ever tell you that the blue pills were the anabolic steroid known as Oral-Turinabol?" the prosecutor asked. "They told us they were vitamin tablets," Christiane said, "just like they served all the girls with meals." "Did defendant Binus ever tell you the injection he gave was Depot-Turinabol?" "Never," Christiane said, staring at Binus until the slight, middle-aged man looked away. "He said the shots were another kind of vitamin."

"He never said he was injecting you with the male hormone testosterone?" the prosecutor persisted. "Neither he nor Herr Gläser ever mentioned Oral-Turinabol or Depot-Turinabol," Christiane said firmly. "Did you take these drugs voluntarily?" the prosecutor asked in a kindly tone. "I was fifteen years old when the pills started," she replied, beginning to lose her composure. "The training motto at the pool was, 'You eat the pills, or you die.' It was forbidden to refuse."

As her testimony ended, Knacke-Sommer pointed at the two defendants and shouted, "They destroyed my body and my mind!" Then she rose and threw her Olympic medal to the floor.

Anabolic steroids have been used to enhance athletic performance since the early sixties, when an American physician gave the drugs to three weight lifters, who promptly jumped from mediocrity to world records. But no one ever took the use of illegal drugs quite so far as the East Germans. In a military hospital outside the former East Berlin, in 1991, investigators discovered a ten-volume archive meticulously detailing every national athletic achievement from the mid-sixties to the fall of the Berlin Wall, each entry annotated with the name of the drug and the dosage given to the athlete. An average teen-age girl naturally produces somewhere around half a milligram of testosterone a day. The East German sports authorities routinely prescribed steroids to young adolescent girls in doses of up to thirty-five milligrams a day. As the investigation progressed, former female athletes, who still had masculinized physiques and voices, came forward with tales of deformed babies, inexplicable tumors, liver dysfunction, internal bleeding, and depression. German prosecutors handed down hundreds of indictments of former coaches, doctors, and sports officials, and won numerous convictions. It was the kind of spectacle that one would have thought would shock the sporting world. Yet it didn't. In a measure of how much the use of drugs in competitive sports has changed in the past quarter century, the trials caused barely a ripple.

Today, coaches no longer have to coerce athletes into taking drugs. Athletes take them willingly. The drugs themselves are used in smaller doses and in creative combinations, leaving few tell-tale physical signs, and drug testers concede that it is virtually impossible to catch all the cheaters, or even, at times, to do much more than guess when cheating is taking place. Among the athletes, meanwhile, there is growing uncertainty about what exactly is wrong with dop-

ing. When the cyclist Lance Armstrong asserted last year, after his second consecutive Tour de France victory, that he was drug-free, some doubters wondered whether he was lying, and others simply assumed he was, and wondered why he had to. The moral clarity of the East German scandal—with its coercive coaches, damaged athletes, and cor-

tion. No athlete of Johnson's calibre has ever been exposed so dramatically, but his disgrace was not quite the victory for clean competition that it appeared to be.

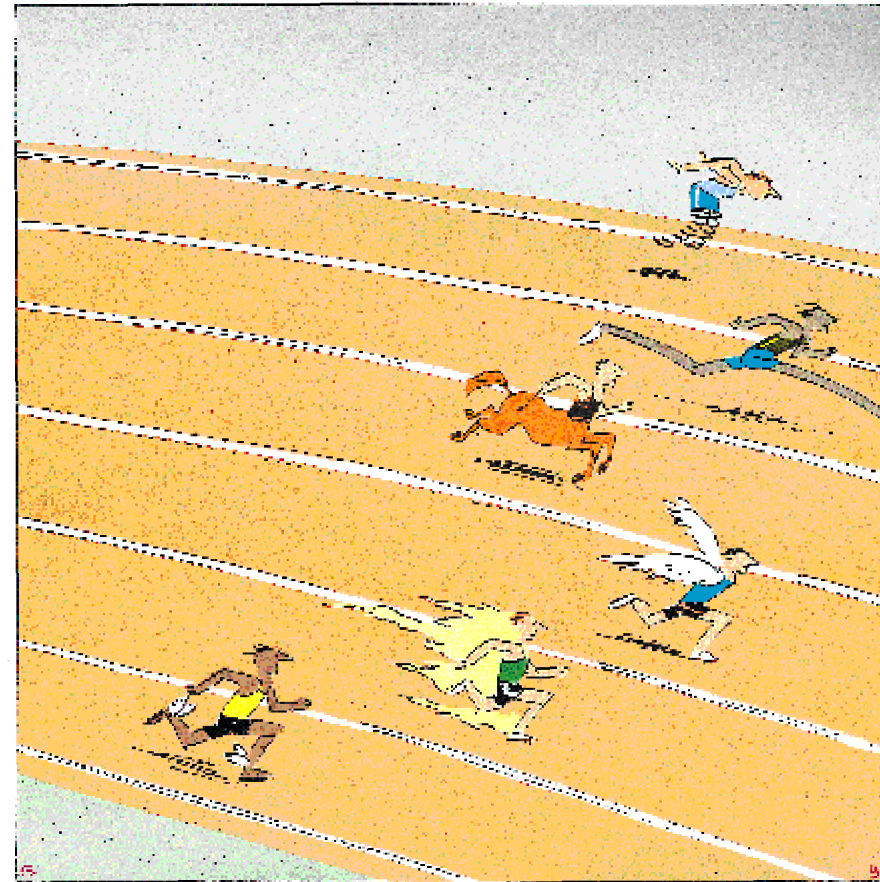
Johnson was part of a group of world-class sprinters based in Toronto in the nineteen-seventies and eighties and trained by a brilliant coach named Charlie Francis. Francis was driven and ambi-

measured in hundredths of a second; athletes, once they have reached their early twenties, typically improve their performance in small, steady increments, as experience and strength increase. But these were quantum leaps, and to Francis the explanation was obvious. "Angella wasn't losing ground because of a talent gap," he writes; "she was losing because of a drug gap, and it was widening by the day." (In the case of Koch, at least, he was right. In the East German archives, investigators found a letter from Koch to the director of research at V.E.B. Jenapharm, an East German pharmaceutical house, in which she complained, "My drugs were not as potent as the ones that were given to my opponent Bärbel Eckert, who kept beating me." In East Germany, Ungerleider writes, this particular complaint was known as "dope-envy.") Later, Francis says, he was confronted at a track meet by Brian Oldfield, then one of the world's best shot-putters:

"When are you going to start getting serious?" he demanded. "When are you going to tell your guys the facts of life?" I asked him how he could tell they weren't already using steroids. He replied that the muscle density just wasn't there. "Your guys will never be able to compete against the Americans—their careers will be over," he persisted.

Among world-class athletes, the lure of steroids is not that they magically transform performance—no drug can do that—but that they make it possible to train harder. An aging baseball star, for instance, may realize that what he needs to hit a lot more home runs is to double the intensity of his weight training. Ordinarily, this might actually hurt his performance. "When you're under that kind of physical stress," Charles Yesalis, an epidemiologist at Pennsylvania State University, says, "your body releases corticosteroids, and when your body starts making those hormones at inappropriate times it blocks testosterone. And instead of being anabolic—instead of building muscle—corticosteroids are catabolic. They break down muscle. That's clearly something an athlete doesn't want." Taking steroids counteracts the impact of corticosteroids and helps the body bounce back faster. If that home-run hitter was taking testosterone or an anabolic steroid, he'd have a better chance of handling the extra weight training.

It was this extra training that Francis



"Only careless and stupid people ever get caught in drugs," one steroid expert says.

rupted competitions—has given way to shades of gray. In today's climate, the most telling moment of the East German scandal was not Knacke-Sommer's outburst. It was when one of the system's former top officials, at the beginning of his trial, shrugged and quoted Brecht: "Competitive sport begins where healthy sport ends."

Perhaps the best example of how murky the drug issue has become is the case of Ben Johnson, the Canadian sprinter who won the one hundred metres at the Seoul Olympics, in 1988. Johnson set a new world record, then failed a post-race drug test and was promptly stripped of his gold medal and suspended from international competi-

tious, eager to give his athletes the same opportunities as their competitors from the United States and Eastern Europe, and in 1979 he began discussing steroids with one of his prize sprinters, Angella Taylor. Francis felt that Taylor had the potential that year to run the two hundred metres in close to 22.90 seconds, a time that would put her within striking distance of the two best sprinters in the world, Evelyn Ashford, of the United States, and Marita Koch, of East Germany. But, seemingly out of nowhere, Ashford suddenly improved her two-hundred-metre time by six-tenths of a second. Then Koch ran what Francis calls, in his autobiography, "Speed Trap," a "science fictional" 21.71. In the sprints, individual improvements are usually

and his sprinters felt they needed to reach the top. Angella Taylor was the first to start taking steroids. Ben Johnson followed in 1981, when he was twenty years old, beginning with a daily dose of five milligrams of the steroid Dianabol, in three-week on-and-off cycles. Over time, that protocol grew more complex. In 1984, Taylor visited a Los Angeles doctor, Robert Kerr, who was famous for his willingness to provide athletes with pharmacological assistance. He suggested that the Canadians use human growth hormone, the pituitary extract that promotes lean muscle and that had become, in Francis's words, "the rage in elite track circles." Kerr also recommended three additional substances, all of which were believed to promote the body's production of growth hormone: the amino acids arginine and ornithine and the dopamine precursor L-dopa. "I would later learn," Francis writes, "that one group of American women was using three times as much growth hormone as Kerr had suggested, in addition to 15 milligrams per day of Dianabol, another 15 milligrams of Anavar, large amounts of testosterone, and thyroxine, the synthetic thyroid hormone used by athletes to speed the metabolism and keep people lean." But the Canadians stuck to their initial regimen, making only a few changes: Vitamin B₁₂, a non-steroidal muscle builder called inosine, and occasional shots of testosterone were added; Dianabol was dropped in favor of a newer steroid called Furazabol; and L-dopa, which turned out to cause stiffness, was replaced with the blood-pressure drug Dixarit.

Going into the Seoul Olympics, then, Johnson was a walking pharmacy. But—and this is the great irony of his case—none of the drugs that were part of his formal pharmaceutical protocol resulted in his failed drug test. He had already reaped the benefit of the steroids in intense workouts leading up to the games, and had stopped Furazabol and testosterone long enough in advance that all traces of both supplements should have disappeared from his system by the time of his race—a process he sped up by taking the diuretic Moduret. Human growth hormone wasn't—and still isn't—detectable by a drug test, and arginine, ornithine, and Dixarit were legal. Johnson should have been clean. The most striking (and unintentionally hilarious) mo-

ment in "Speed Trap" comes when Francis describes his bewilderment at being informed that his star runner had failed a drug test—for the anabolic steroid stanozolol. "I was floored," Francis writes:

To my knowledge, Ben had never injected stanozolol. He occasionally used Winstrol, an oral version of the drug, but for no more than a few days at a time, since it tended to make him stiff. He'd always discontinued the tablets at least six weeks before a meet, well beyond the accepted "clearance time." . . . After seven years of using steroids, Ben knew what he was doing. It was inconceivable to me that he might take stanozolol on his own and jeopardize the most important race of his life.

Francis suggests that Johnson's urine sample might have been deliberately contaminated by a rival, a charge that is less preposterous than it sounds. Documents from the East German archive show, for example, that in international competitions security was so lax that urine samples were sometimes switched, stolen from a "clean" athlete, or simply "borrowed" from a noncompetitor. "The pure urine would either be infused by a catheter into the competitor's bladder (a rather painful procedure) or be held in condoms until it was time to give a specimen to the drug control lab," Ungerleider writes. (The top East German sports official Manfred Höppner was once in charge of urine samples at an international weight-lifting competition. When he realized that several of his weight lifters would not pass the test, he broke open the seal of their specimens, poured out the contents, and, Ungerleider notes, "took a nice long leak of pure urine into them.") It is also possible that Johnson's test was simply botched. Two years later, in 1990, track and field's governing body claimed that Butch Reynolds, the world's four-hundred-metre record holder, had tested positive for the steroid nandrolone, and suspended him for two years. It did so despite the fact that half of his urine-sample data had been misplaced, that the testing equipment had failed during analysis of the other half of his sample, and that the lab technician who did the test identified Sample H6 as pos-



itive—and Reynolds's sample was numbered H5. Reynolds lost the prime years of his career.

We may never know what really happened with Johnson's assay, and perhaps it doesn't much matter. He *was* a dooper. But clearly this was something less than a victory for drug enforcement. Here was a man using human growth hormone, Dixarit, inosine, testosterone, and Furazabol, and the only substance that the testers could find in him was stanozolol—which may have been the only illegal drug that he *hadn't* used. Nor is it encouraging that Johnson was the only prominent athlete caught for drug use in Seoul. It is hard to believe, for instance, that the sprinter Florence Griffith Joyner, the star of the Seoul games, was clean. Before 1988, her best times in the hundred metres and the two hundred metres were, respectively, 10.96 and 21.96. In 1988, a suddenly huskier FloJo ran 10.49 and 21.34, times that no runner since has even come close to equalling. In other words, at the age of twenty-eight—when most athletes are beginning their decline—Griffith Joyner transformed herself in one season from a career-long better-than-average sprinter to the fastest female sprinter in history. Of course, FloJo never failed a drug test. But what does that prove? FloJo went on to make a fortune as a corporate spokeswoman. Johnson's suspension cost him an estimated twenty-five million dollars in lost endorsements. The real lesson of the Seoul Olympics may simply have been that Johnson was a very unlucky man.

The basic problem with drug testing is that testers are always one step behind athletes. It can take years for sports authorities to figure out what drugs athletes are using, and even longer to devise effective means of detecting them. Anabolic steroids weren't banned by the International Olympic Committee until 1975, almost a decade after the East Germans started using them. In 1996, at the Atlanta Olympics, five athletes tested positive for what we now know to be the drug Bromantan, but they weren't suspended, because no one knew at the time what Bromantan was. (It turned out to be a Russian-made psycho-stimulant.) Human growth hormone, meanwhile, has been around for twenty years, and testers still haven't figured out how to detect it.

Perhaps the best example of the diffi-

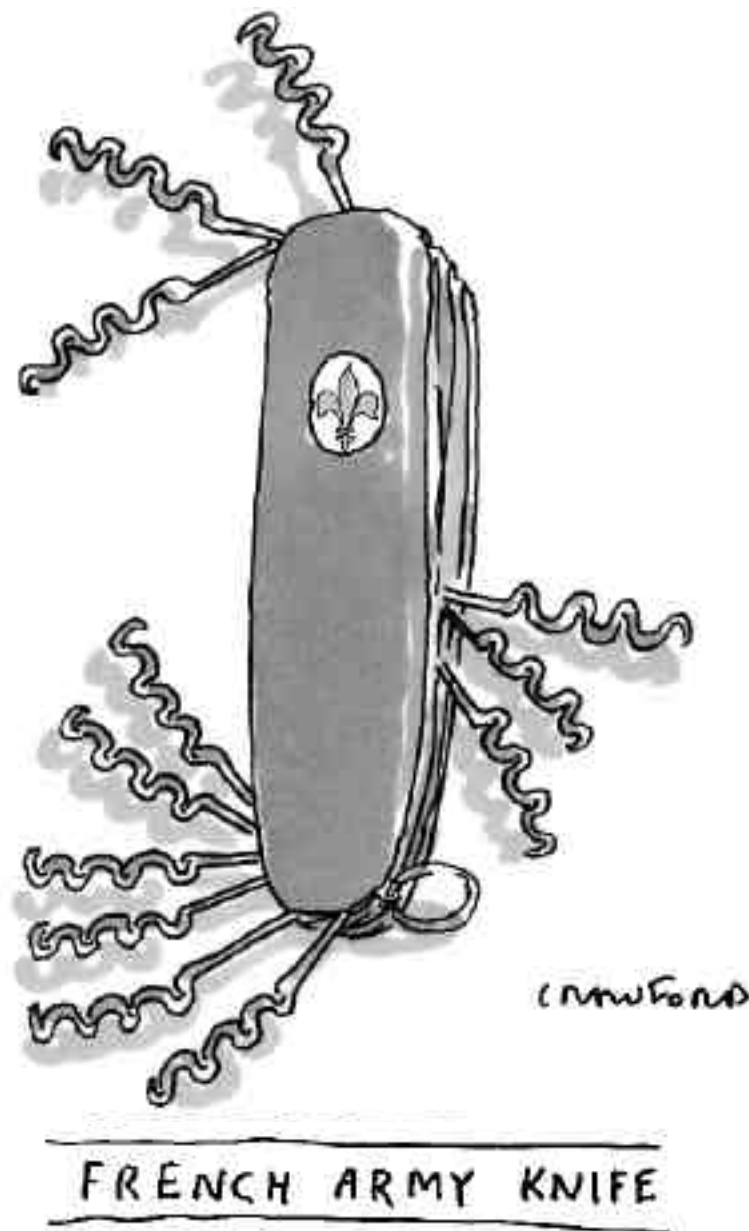
culties of drug testing is testosterone. It has been used by athletes to enhance performance since the fifties, and the International Olympic Committee announced that it would crack down on testosterone supplements in the early nineteen-eighties. This didn't mean that the I.O.C. was going to test for testosterone directly, though, because the testosterone that athletes were getting from a needle or a pill was largely indistinguishable from the testosterone they produce naturally. What was proposed, instead, was to compare the level of testosterone in urine with the level of another hormone, epitestosterone, to determine what's called the T/E ratio. For most people, under normal circumstances, that ratio is 1:1, and so the theory was that if testers found a lot more testosterone than epitestosterone it would be a sign that the athlete was cheating. Since a small number of people have naturally high levels of testosterone, the I.O.C. avoided the risk of falsely accusing anyone by setting the legal limit at 6:1.

Did this stop testosterone use? Not at all. Through much of the eighties and nineties, most sports organizations conducted their drug testing only at major competitions. Athletes taking testosterone would simply do what Johnson did, and taper off their use in the days or weeks prior to those events. So sports authorities began randomly showing up at athletes' houses or training sites and demanding urine samples. To this, dopers responded by taking extra doses of epitestosterone with their testosterone, so their T/E would remain in balance. Testers, in turn, began treating elevated epitestosterone levels as suspicious, too. But that still left athletes with the claim that they were among the few with naturally elevated testosterone. Testers, then, were forced to take multiple urine samples, measuring an athlete's T/E ratio over several weeks. Someone with a naturally elevated T/E ratio will have fairly consistent ratios from week to week. Someone who is doping will have telltale spikes—times immediately after taking shots or pills when the level of the hormone in his blood soars. Did all these precautions mean that cheating stopped? Of course not. Athletes have now switched from injection to transdermal testosterone patches, which administer a continuous low-level dose of the hormone,

smoothing over the old, incriminating spikes. The patch has another advantage: once you take it off, your testosterone level will drop rapidly, returning to normal, depending on the dose and the person, in as little as an hour. "It's the peaks that get you caught," says Don Catlin, who runs the U.C.L.A. Olympic Analytical Laboratory. "If you took a pill this morning and an unannounced test comes this afternoon, you'd better have a bottle of epitestosterone handy. But, if you are on the patch and you know your own pharmacokinetics, all you have to do is pull it off." In other words, if you know how long it takes for you to get back under the legal limit and successfully stall

the test for that period, you can probably pass the test. And if you don't want to take that chance, you can just keep your testosterone below 6:1, which, by the way, still provides a whopping performance benefit. "The bottom line is that only careless and stupid people ever get caught in drug tests," Charles Yesalis says. "The elite athletes can hire top medical and scientific people to make sure nothing bad happens, and you can't catch them."

But here is where the doping issue starts to get complicated, for there's a case to be made that what looks like failure really isn't—that regulating aggressive doping, the way the 6:1 standard does, is



a better idea than trying to prohibit drug use. Take the example of erythropoietin, or EPO. EPO is a hormone released by your kidneys that stimulates the production of red blood cells, the body's oxygen carriers. A man-made version of the hormone is given to those with suppressed red-blood-cell counts, like patients undergoing kidney dialysis or chemotherapy. But over the past decade it has also become the drug of choice for endurance athletes, because its ability to increase the amount of oxygen that the blood can carry to the muscles has the effect of postponing fatigue. "The studies that have attempted to estimate EPO's importance say it's worth about a three-, four-, or five-per-cent advantage, which is huge," Catlin says. EPO also has the advantage of being a copy of a naturally occurring substance, so it's very hard to tell if someone has been injecting it. (A cynic would say that this had something to do with the spate of remarkable times in endurance races during that period.)

So how should we test for EPO? One approach, which was used in the late nineties by the International Cycling Union, is a test much like the T/E ratio for testosterone. The percentage of your total blood volume which is taken up by red blood cells is known as your hematocrit. The average adult male has a hematocrit of between thirty-eight and forty-four per cent. Since 1995, the cycling authorities have declared that any

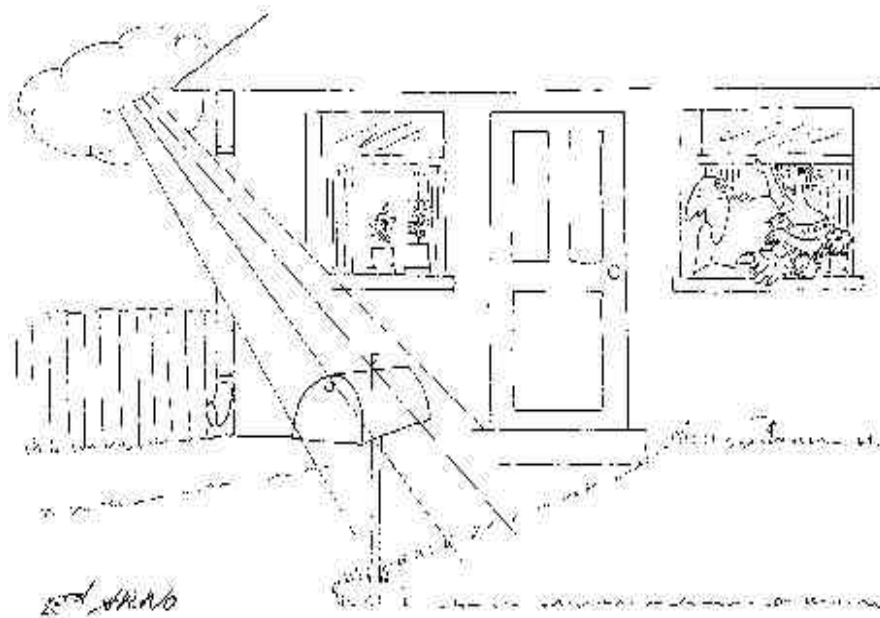
rider who had a hematocrit above fifty per cent would be suspended—a deliberately generous standard (like the T/E ratio) meant to avoid falsely accusing someone with a naturally high hematocrit. The hematocrit rule also had the benefit of protecting athletes' health. If you take too much EPO, the profusion of red blood cells makes the blood sluggish and heavy, placing enormous stress on the heart. In the late eighties, at least fifteen professional cyclists died from suspected EPO overdoses. A fifty-per-cent hematocrit limit is below the point at which EPO becomes dangerous.

But, like the T/E standard, the hematocrit standard had a perverse effect: it set the legal limit so high that it actually encouraged cyclists to titrate their drug use up to the legal limit. After all, if you are riding for three weeks through the mountains of France and Spain, there's a big difference between a hematocrit of forty-four per cent and one of 49.9 per cent. This is why Lance Armstrong faced so many hostile questions about EPO from the European press—and why eyebrows were raised at his five-year relationship with an Italian doctor who was thought to be an expert on performance-enhancing drugs. If Armstrong had, say, a hematocrit of forty-four per cent, the thinking went, why *wouldn't* he have raised it to 49.9, particularly since the rules (at least, in 2000) implicitly allowed him to do so. And,

if he didn't, how on earth did he win?

The problems with hematocrit testing have inspired a second strategy, which was used on a limited basis at the Sydney Olympics and this summer's World Track and Field Championships. This test measures a number of physiological markers of EPO use, including the presence of reticulocytes, which are the immature red blood cells produced in large numbers by EPO injections. If you have a lot more reticulocytes than normal, then there's a good chance you've used EPO recently. The blood work is followed by a confirmatory urinalysis. The test has its weaknesses. It's really only useful in picking up EPO used in the previous week or so, whereas the benefits of taking the substance persist for a month. But there's no question that, if random EPO testing were done aggressively in the weeks leading to a major competition, it would substantially reduce cheating.

On paper, this second strategy sounds like a better system. But there's a perverse effect here as well. By discouraging EPO use, the test is simply pushing savvy athletes toward synthetic compounds called hemoglobin-based oxygen carriers, which serve much the same purpose as EPO but for which there is no test at the moment. "I recently read off a list of these new blood-oxygen expanders to a group of toxicologists, and none had heard of any of them," Yesalis says. "That's how fast things are moving." The attempt to prevent EPO use actually promotes inequity: it gives an enormous advantage to those athletes with the means to keep up with the next wave of pharmacology. By contrast, the hematocrit limit, though more permissive, creates a kind of pharmaceutical parity. The same is true of the T/E limit. At the 1986 world swimming championships, the East German Kristin Otto set a world record in the hundred-metre freestyle, with an extraordinary display of power in the final leg of the race. According to East German records, on the day of her race Otto had a T/E ratio of 18:1. Testing can prevent that kind of aggressive doping; it can insure no one goes above 6:1. That is a less than perfect outcome, of course, but international sports is not a perfect world. It is a place where Ben Johnson is disgraced and FloJo runs free, where Butch Reynolds is barred for



"My guess is our tax rate has arrived."

two years and East German coaches pee into cups—and where athletes without access to the cutting edge of medicine are condemned to second place. Since drug testers cannot protect the purity of sport, the very least they can do is to make sure that no athlete can cheat more than any other.

The first man to break the four-minute mile was the Englishman Roger Bannister, on a windswept cinder track at Oxford, nearly fifty years ago. Bannister is in his early seventies now, and one day last summer he returned to the site of his historic race along with the current world-record holder in the mile, Morocco's Hicham El Guerrouj. The two men chatted and compared notes and posed for photographs. "I feel as if I am looking at my mirror image," Bannister said, indicating El Guerrouj's similarly tall, high-waisted frame. It was a polite gesture, an attempt to suggest that he and El Guerrouj were part of the same athletic lineage. But, as both men surely knew, nothing could be further from the truth.

Bannister was a medical student when he broke the four-minute mile in 1954. He did not have time to train every day, and when he did he squeezed in his running on his hour-long midday break at the hospital. He had no coach or trainer or entourage, only a group of running partners who called themselves "the Paddington lunch time club." In a typical workout, they might run ten consecutive quarter miles—ten laps—with perhaps two minutes of recovery between each repetition, then gobble down lunch and hurry back to work. Today, that training session would be considered barely adequate for a high-school miler. A month or so before his historic mile, Bannister took a few days off to go hiking in Scotland. Five days before he broke the four-minute barrier, he stopped running entirely, in order to rest. The day before the race, he slipped and fell on his hip while working in the hospital. Then he ran the most famous race in the history of track and field. Bannister was what runners admiringly call an "animal," a natural.

El Guerrouj, by contrast, trains five hours a day, in two two-and-a-half-hour sessions. He probably has a team of half a dozen people working with

him: at the very least, a masseur, a doctor, a coach, an agent, and a nutritionist. He is not in medical school. He does not go hiking in rocky terrain before major track meets. When Bannister told him, last summer, how he had prepared for his four-minute mile, El Guerrouj was stunned. "For me, a rest day is perhaps when I train in the morning and spend the afternoon at the cinema," he said. El Guerrouj certainly has more than his share of natural ability, but his achievements are a reflection of much more than that: of the fact that he is better coached and better prepared than his opponents, that he trains harder and more intelligently, that he has found a way to stay injury free, and that he can recover so quickly from one day of five-hour workouts that he can follow it, the next day, with another five-hour workout.

Of these two paradigms, we have always been much more comfortable with the first: we want the relation between talent and achievement to be transparent, and we worry about the way ability is now so aggressively managed and augmented. Steroids bother us because they violate the honesty of effort: they permit an athlete to train too hard, beyond what seems reasonable. EPO fails the same test. For years, athletes underwent high-altitude training sessions, which had the same effect as EPO—promoting the manufacture of additional red blood cells. This was considered acceptable, while EPO is not, because we like to distinguish between those advantages which are natural or earned and those which come out of a vial.

Even as we assert this distinction on the playing field, though, we defy it in our own lives. We have come to prefer a world where the distractable take Ritalin, the depressed take Prozac, and the unattractive get cosmetic surgery to a world ruled, arbitrarily, by those fortunate few who were born focussed, happy, and beautiful. Cosmetic surgery is not "earned" beauty, but then natural beauty isn't earned, either. One of the principal contributions of the late twentieth century was the moral deregulation of social competition—the insistence that advantages derived from artificial and extraordinary intervention are no less legitimate than the advantages of nature. All that athletes want, for better or worse, is the chance to play by those same rules. ♦