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Sport as a Common Property Resource

A SOLUTION TO THE DILEMMAS OF DOPING

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The use of drugs in high-performance sports (doping) is a common pool resource (CPR) dilemma: regardless of the number of other athletes who dope, the athlete with strong tastes for victory will find doping optimal; yet if all athletes dope, they all bear negative health consequences, although each one's odds of victory are not greatly changed. The current regulatory approach relies entirely on centralized bureaucratic methods and is ineffective. The authors use insights developed in the common property resource literature and the theory of social norms to analyze the failure of these methods. The programs they propose—the drug diary and a collegial enforcement system—are superior to the current system in that they encourage the development of athletic norms against unfair drug use. In the end, such norms are the only hope for controlling doping, which is becoming increasingly difficult to observe. Empirical evidence shows that such norms against unobservable sports violations can be very powerful. Norms of conduct in golf, for example, successfully enforce that sport's many rules regulating unobservable aspects of play.

DOPING IN SPORTS: PRACTICE AND THEORY

In sports, rules have two effects. One is private: rules produce an entertaining game that generates private benefits for players, owners, and especially spectators. The other is social: rules tend to reward play that exhibits self-discipline, sacrifice for the good of the whole, and fair play (Sheed 1995). Officials are given the explicit duty of immediately and publicly punishing any violations of these norms, thereby demonstrating that violations will be looked down upon in daily life as well. As metaphors of good living, the rules of sports provide important social benefits. If a set of rules confronts athletes with incentives counter to virtuous behavior, sports administrators should consider adopting different rules.

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In this article, we argue that the current rules against the use of performance-enhancing drugs do confront athletes with incentives counter to virtuous behavior, and therefore we urge sports administrators to consider different rules. The use of such drugs, also called "doping," has a long history. Soon after the male hormone testosterone was first isolated in the laboratory in the 1930s, research began into the connection between synthetic hormones and athletic ability. Early research results were made accessible in Paul De Kruif's *The Male Hormone* (1945), and, by the late 1940s, bodybuilders on the west coast of the United States were experimenting with hormone products. In the early 1950s, the Soviet Union was using hormone treatments to enhance the performance of its weight-lifting team. After this became known at the 1954 World Championships, the U.S. team also began experimenting with hormones. The use of anabolic steroids and other hormonal products then spread rapidly to other sports (Hoberman and Yesalis 1995).

Most commentators agree that the use of such drugs, especially when it occurs in secret, interferes with several lessons sports are expected to teach, especially self-discipline and fair play (Arnold 1993; also see Fost 1991). This opinion was ratified legally in 1963 when the European Parliament, responding to the rise in drug use, defined doping in sports as "the administration or the use of exogenous substances in an abnormal form or way to *healthy* persons where the only goal is to achieve an artificial and unfair improvement of the performance in the contest" (Reiter 1994, 191, emphasis added).

Under this mandate, enforcement institutions have been established at the national and international levels in all major sports. These institutions rely without exception on one regulatory system, the *negative list*. The International Olympic Committee declares, for example, that "doping is the use of substances made of prohibited active ingredient groups and the utilization of prohibited methods. A list follows" (Berendonk 1992, 23). Athletes or their agents discovered to have used a drug or procedure on the list are subject to sanction.

Currently, the negative list of banned substances and procedures is enforced by random tests of blood or urine samples from performing athletes. Perhaps the most famous example of the institutions at work occurred at the 1988 Olympic Games. Sprinter Ben Johnson won the gold medal in the 100-meter dash but was subsequently disqualified when anabolic steroids were discovered in his bloodstream. This incident is unfortunately only one of many, and leading athletes have been disqualified in almost every major sport. This and other evidence suggest that doping is quite common at all levels, even at U.S. high schools (Greenhouse 1995). To simplify discussion, however, we will focus our attention on professional track and field, which has been particularly plagued by drug use and has made a serious regulatory effort against it (Hoberman 1992).

Given that new cases of doping are discovered regularly, however,¹ it is evident that the underlying incentives for athletes to dope outweigh whatever disincentives the current rules impose. Rational choice theory indicates why. Doping has the structure

1. The most recent case as of this writing involves Mary Slaney, the U.S. track star. It is no exaggeration to state that a new doping case has been in the sports pages in Europe or America at every new stage in the development of this article.

of a common pool resource (CPR) problem. It can be described in a simple model, such as Breivik's (1987) Lombardian doping game; the players believe that "winning isn't everything, it's the only thing."² Suppose there are N athletes in a competition, with a distribution of tastes over victory and long-run health. Suppose some number D of the athletes dope. The probability of victory for athlete i is some function $p(d_i, D, x_i)$, where d_i equals 1 if i dopes, 0 otherwise, and x_i are athlete i 's exogenous abilities. The critical point is that $p(1, D, x_i) > p(0, D, x_i)$ for any D and x . If D is zero, any athlete who dopes will gain an advantage in the competition; those with strong preferences for victory over health will therefore dope. If $D = N - 1$, the single nondoping athlete will almost surely lose; again, with sufficiently strong tastes for victory, this athlete will dope. Thus, if all athletes have reasonably strong tastes for victory (as top professionals almost surely do), each athlete will choose to dope no matter how many others are doing so; in equilibrium, all athletes dope. As in all common pool resource problems, these strategies are individually incentive compatible but result in lower utility for everyone: the order of finish among completely doped athletes is probably not much different from that of completely undoped athletes, yet the doped athletes suffer health consequences and perhaps financial consequences because sponsors and fans (who have shown a general dislike for doping) devote themselves to cleaner forms of entertainment.

We believe that viewing doping as a CPR problem offers new hope for a solution. The basic structure of the CPR problem is by now well known among social scientists (see Gordon 1954; Hardin 1968; Ostrom 1990). It has been analyzed in the context of fisheries, meadows, water rights, experiments, and elsewhere, with the results of the analysis following a surprisingly simple pattern (Ostrom, Gardner, and Walker 1994). First, reasonable thinkers who become directly involved in a CPR problem can recognize what is happening and will think of ways to restrain the collectively damaging behavior. The focus is on changing the incentives of the various parties—how can the socially optimal behavior be made individually optimal? Second, those thinkers usually attempt to change incentives in one of two ways: either by use of law and governmental power or by use of reciprocal punishments. The former approach has a governing body declare that certain behaviors are illegal; the government hires agents to observe all parties and to impose punishments on those violating the laws. The latter approach has the parties themselves announce specific punitive responses to socially damaging behavior; violators become social outcasts in addition to bearing real damages by other participants. Formal governmental agencies are not involved.

Third, it appears that these informal self-enforcement institutions do a better job at controlling behavior than formal regulatory institutions. Informal society has at its command more information and more costly punishments than the formal government.

2. Although it has been attributed to Vince Lombardi, the famously tough coach of the Green Bay Packers football team, the phrase actually belongs to Red Sanders of Vanderbilt University. We thank Stan Engerman for pointing this out.

Chicago physician and author Bob Goldman has surveyed athletes on the following question: "You are offered a performance-enhancing substance, with two guarantees: (1) You will not be caught. (2) You will win every competition you enter for the next five years, and then you will die from the side effects of the substance. Would you take it?" More than half the respondents answered yes (reported in Bamberger and Yaeger 1997, 62).

Its mechanisms of behavioral regulation are often internalized as social norms, making behavioral control costless and completely effective in the long run. The many advantages of informal conflict resolution in the CPR problem have only recently been perceived by social scientists, although there is now a growing body of theoretical support for the idea that informal social norms represent equilibrium strategies that solve various social problems (Sethi and Somanathan 1996; Bendor and Swistak 1997; Goyal 1996; Bird 1997; Young 1993). Slowly, the lessons of this literature are being applied to real-world problems.

It is striking how apt the findings of this literature are to the problem of doping regulation in sports. Doping is clearly a CPR problem, indeed a very difficult one (for reasons of observability that we will relate momentarily), but athletes are typically thought of as bound together in a tightly knit community with strong preferences for (or at least familiarity with) normatively approved behavior and "fair play." Thus, doping in sports seems a natural case for the application of an informal norm-enforcement institution. Yet, the current anti-doping regulatory system is based entirely on the model of formal law enforcement, with officers, administrations, courts, evidence, testimony, and proceedings.³ And, as the CPR literature predicts, formal anti-doping regulations fail to restrain the practice: they have inadequate information and insufficient resources at hand; they do not alter significantly the incentives of the athletes. Testimony to the ineffectiveness of these institutions is the fact that many athletes refer to the 1996 Atlanta Olympics as the "Human Growth Hormone Games" (Bamberger and Yaeger 1997).⁴

In this study, we analyze the doping problem in more detail and bring out some of the features that make it an especially difficult CPR problem (next section). In the third section, we propose specific regulatory reforms that, we argue, are likely to lead to the informal norm enforcement that this particular CPR problem will require. In the fourth section, we discuss empirical evidence supporting our case. The fifth section considers the transition from the current system to the one we propose, and the sixth section summarizes our argument.

THE DOPING PROBLEM

We begin with the empirical fact that virtually all professional and amateur sports have decided that doping should be controlled. Although doping may enhance human performance in the short run, it can damage health in the long run. More important,

3. Doping rules are, in fact, rules of sport, not of civil society. Most doping drugs are entirely legal from the standpoint of national governments. The absurdity of their quasi-legal character then becomes apparent when one asks, what would be the consequences for athletes and for sports if the offside rule in football (soccer) were to be adjudicated by a system of quasi-courts of referees convening after the game? True, with the advantage of television replay and multiple testimony, the rule might be more exactly enforced. But the point of sports is to have a contest decided on the field, where it can be observed. By putting doping in the realm of quasi-law, the current system concocts a blend of sports and law that is ultimately not good for sports.

4. There may be deeper reasons for the regulations' failure, in that those who administer the rules have an incentive to keep things as they are. We return to this point later.

the public does not seem to view doping as a fair way to win (Sheed 1995). This is absolutely critical to our argument: the public, like most athletes, thinks doping is cheating.⁵ A sport that allows doping reduces its marketability, and this, perhaps more than anything else, explains why the sports world seems to take doping seriously. The universal regulatory approach has been to ban athletes from putting certain substances into their bodies within a reasonable time before a competition (Hoberman 1992, 100). The ban is enforced by a system of random tests at the time of competition. We call this the negative-list method of doping regulation; judging from the frequency of observed violations, this system does not discourage doping.

The roots of the system's failure lie in the incentives posed by the Lombardian CPR game that the athletes play; in the absence of any regulating institution or norm, all athletes who want to win will dope. Now assume there exists a technology that at some cost can accurately detect substances in the bloodstream.⁶ An Orwellian world would have all athletes tested all the time; if anything is detected that seems to have been taken as dope rather than medicine, that is, to enhance performance rather than restore health, the athlete can be punished. The Orwellian scenario is expensive, however. A less costly system with high penalties and random tests can be erected. In principle, such a system should be able to make the expected costs of doping exceed the expected benefits (cf. Adolph et al. 1991). This is the object of the negative-list system.

The negative-list system is of course a formal command-and-control response to a CPR problem, and therefore has the usual disadvantages. First, the behavior being banned is based on the European Parliament's fuzzy definition of doping. Doping is defined as a medical treatment that is not needed to serve health but rather is intended solely to enhance human performance. What is the difference between health and the ability to perform? Any drug might be permitted as a "substitution" that serves "regeneration" of the athlete in question (see e.g., Clasing et al. 1992). Moreover, what about practices (such as blood doping) that do not involve drugs per se and would be completely undetectable in any case? It is simply impossible to define in an abstract way whether a medicine or practice actually is doping or not. This does not make doping acceptable; it simply makes it hard to observe. Doping, as a vice, is a finely shaded judgmental affair. The amount of steroids found in Ben Johnson's bloodstream was less than the amount later *recommended* by the World Health Organization as a male contraceptive (Hoberman and Yesalis 1995). A phrase now current among athletes asserts that success requires "a great coach, a great chemist, and a great lawyer" (Bamberger and Yaeger 1997).

Despite having little in the way of abstract principles to guide its decisions, but hoping to provide some practical clarity, the negative-list system attempts to be as specific as possible about which drugs and methods are prohibited. This effort at

5. Irish swimmer Michelle Smith would seem to be a natural as a spokesperson for her country and her sport: she is Ireland's most successful athlete of the modern era. Yet, she is shunned by the world of public relations because of circumstantial evidence that her successes were drug aided (Bamberger 1997).

6. We ignore the possibility of Type I and II errors in drug detection and the existence of substances and practices (such as blood doping) that are completely unobservable. The problems these issues pose are of course insurmountable for any system that relies exclusively on testing to enforce compliance, such as the current system. Our system will, in the end, rely on self-enforcement with direct tests only in rare events; the existence of these testing problems lends more weight to our case.

practical specificity is laudable because it is consistent with the “regularity” of sports rules (Franke 1994, 81). The rules should state simply and cleanly which types of play are unfair. The negative list does this. At the same time, everyone knows that breaking rules and bearing the consequences are part of the strategy of the game. Rules can tacitly encourage the behavior being ruled against: foul shots in basketball stop the clock and thereby can encourage teams to commit fouls when they are in desperate need of game time.

In the same way, the negative list, in its utter clarity about banned substances, tacitly encourages doping. The first source of encouragement is that the system essentially advertises the drugs that seem to work, and then gives a limit that is quite generous. Any athlete under the limit is not violating the rule, and competition forces all athletes to use the drugs up to the limit.

The reason is simple: anything not yet banned is legal. Consider an analogy. Suppose we hoped to control burglary by means of a list that defines and prohibits the use of instruments of burglary. Entering a house using a key is not a crime; entering a house using a crowbar is. The burglar who gets into a house with the help of an item not on the current list cannot be punished. The tool industry would boom as manufacturers raced to develop odd instruments for breaking and entering. These new instruments would obsolesce the moment the legal system caught up and banned them, but that could take quite a bit of time. There would certainly be a lot of burglary, of course, and civic confidence in the public justice system would be pretty low.

The negative-list response to the CPR dilemma has these same effects, thereby creating a second dilemma in the enormous incentives it inspires to produce new and unknown drugs and treatments.⁷ For example, bromantan and creatine are new and unanticipated performance-enhancement drugs that were recently used in competitions, but that had not yet been banned (Cooke et al. 1995; Heck 1995; Bamberger and Yaeger 1997). No athlete can be punished for having used them if they had not been prohibited at the time of competition; the principle *nullum crimen, nulla poena sine lege scripta* (no crime without written law) lies at the heart of any rule system. This gaping loophole, however, creates an industry of drug developers, testers, lawyers, advisers, enforcers, and administrators. Sports regulators are trapped in an endless cat-and-mouse game, in which new drugs enter the sport through one athlete or another, and perhaps produce new world records, only to be banned months later. As the banned list grows, new methods become more sophisticated (cf. Keck and Wagner 1990). Because there is no incentive to pursue safer drugs, one cannot expect the enhanced sophistication of drugs to promote health. As the definition of banned substances becomes broader, there is more uncertainty about the status of any new drug. Is it banned by the current list or not? The burden of proof lies with the regulators; an athlete who has already used a drug of uncertain status cannot be prosecuted after the fact.

Instead, lawyers and doctors on both sides of a disputed issue must resolve things in a quasi-legal (and in some countries truly legal) series of formal proceedings. This is a third dilemma created by the negative-list system: in its efforts to enforce what is,

7. This second dilemma is not addressed by Breivik (1987).

after all, a *sports rule*, the list moves disputes far from the field of play and resolves them in an exceedingly unsporting way. Doping rules are unlike any of the other rules of sports, which are always enforced immediately by means of a short process by the referee (see Gebauer 1989). Instant decisions are necessary because the value of sports, for entertainment purposes and for the demonstration of proper living, results from the attainment of clear and obvious outcomes in relatively short periods of time before the eyes of many spectators. The removal of judgments from the field of play makes all playing-field outcomes tentative and invalidates the sporting character of the event. How many viewers wondered whether Michael Johnson's thrilling performance in the 200-meter race in the 1996 Olympics would be overturned after the fact? The negative-list system planted these doubts. It can take months to enforce doping rules, and the enforcement occurs mostly behind the scenes. Effective or not, these tests and the rules behind them are not sports; they do not preserve games in their nature as games.

In summary, faced with a difficult CPR problem, sports regulators have responded, predictably, with command-and-control enforcement institutions that could be expected to fail for the usual reasons raised in the CPR literature. In addition, however, the doping problem is more difficult because the practice of doping is extraordinarily hard to define in the abstract and observe in practice. Furthermore, the specific structure of the negative list makes things more difficult: it encourages drug development and it enforces sports rules in a quasi-legal and profoundly unsporting way. Thus, any reform of the current system must overcome three dilemmas: how to discourage doping in the first place, how to do so without encouraging new drugs, and how to do so with a minimum of off-the-field testing.

It is a tall order, especially the last requirement. Doping is an unfair practice that is hard to define and observe; the only real hope for ending the practice of doping lies in the norms of fair competition among the athletes. Yet there is hope. Athletes often follow rules even when no one is watching (we will provide examples below). Thus, the right answer to the CPR dilemma is to apply whatever incentives are necessary to induce athletes to develop and follow norms of fair chemical and medical practice. One might say that if such norms were feasible and beneficial, they would have emerged already. Our response is that in addition to its other problems, the negative-list system discourages norm formation. Nothing damages informal norms more than the presence of a failed system of formal laws, which is exactly the state of the negative-list system. Moreover, at no point in the negative-list system do the athletes themselves play a role in enforcement. Doping is a dirty secret of which the athletes are fully aware but are powerless to restrict. We now propose new institutions that give athletes and the public far more power, and therefore, we believe, offer real hope for controlling doping.

OVERCOMING THE DILEMMAS: DRUG DIARIES AND COLLEGIAL ENFORCEMENT

Recognizing that doping is bad for athletes and bad for sports—what alternatives exist to the ineffective, counterproductive method of negative lists?

UNSATISFACTORY ALTERNATIVES

A first suggestion might be positive-list regulation. The authorities would indicate which drugs and procedures were admissible rather than which were banned. This removes the heart of the second dilemma, because it does not give drug makers a window of time in which to make and promote drugs that have not yet been banned. On the contrary, drug makers would have to submit their products in advance for approval, or, alternatively, make no effort to remain legal but rather sell the drugs in secret from the beginning. Because the costs of supplying drugs in an entirely criminal fashion are probably significant, the positive-list method would at least do more to discourage the development of sophisticated new drugs than the negative-list method.

The positive-list method does little more than this, however, and it has unfortunate side effects. On the first point, for instance, it suffers from the same legal ambiguity as the negative-list system, and relies on the same random-test system that generates *ex post* disqualifications. The positive list also continues to reward secrecy, doing nothing to make the conditions of play more apparent or to encourage norms against drug use. As for side effects, note that the positive-list method bans all new drugs, at least for a time. This discourages the development of drugs for health as well as drugs for performance. There is nothing wrong with medical progress if it occurs for health reasons, however. Under the positive-list regulation, the pace of world records would slow simply because improvements in the ability of medicine to keep athletes healthy would be delayed.

Another regulatory innovation one might consider is the abandonment of all regulation, in effect assigning to athletes full property rights over their drug use (Fost 1991). Outcomes would then be authentic because there would be no possibility of *ex post* disqualification. The criminal element of drug use would vanish. There would be no expenses for testing. If one were willing to include the wise management of drugs as part of the abilities required to win, one could even say that fair play would be guaranteed because everyone had access to the same drugs.

Free release, however, merely abandons athletes to the full consequences of the collective self-damage problem described in the first dilemma. A completely unregulated sport would be dominated by drug use, and everyone would be worse off. The external social costs of free release are also sizable. The proper drug regimen would become part of the standard of victory in the 100-meter dash. It is very unlikely that the public would believe that drugs ought to be part of the standard of victory, nor is it likely that audiences would rely allegorically on a sport in which athletes consented to damaging their future health for an immediate victory. True, spectators could spend their money elsewhere, perhaps on drug-free competitions. Although this would create drug-free athletes, how could these athletes identify themselves credibly in a world where drug use was completely unmonitored?

Positive-list regulation and unrestricted property rights are both insufficient responses to doping, yet they offer clues about what would work best. The best policies would permit the public's interest in sports to be expressed clearly in the incentives facing athletes. For this, the public would have to observe drug use. This means that

drug-free athletes would have to have institutions that credibly and accurately reported their behavior. The policies we propose would do this.

THE DRUG DIARY

The first policy we propose recognizes that much of the problem in doping relates to the fact that athletes and their doctors know much more about the medications they are taking and the reasons for taking them than anyone else does. If the regulatory system expects the authorities first to define doping and then to prove that a certain athlete has taken a certain drug with the explicit purpose of doping, spectators will never know for sure who has taken what. Most drug use will simply fall through the wide cracks left by such an ambiguous system, and will remain invisible.

To remove both the secrecy and the ambiguity of regulation, we propose to shift the burden of proof to the athletes (Keck and Wagner 1990). Each athlete would maintain a drug diary that would become part of the public record. The diary would indicate which drugs were taken, in what quantity, when, where, how, and under whose direction. No drugs would be expressly prohibited, though to keep spectators informed, the authorities would publish a list of drugs thought to be primarily performance enhancers. They also would publish information on the health consequences of various drugs. Finally, the authorities would have to enforce the drug diary by random tests as they now do.

Note, however, how these tests would change athletes' incentives. The tests are comprehensive, for *any* drug not listed in the diary. (Of course, this makes them more expensive.) The term doping would now refer not to the use of a drug on a negative list but to any drug used in secret. This includes drugs thought to be harmless. In effect, athletes define the practice of doping themselves: dope is any drug that enhances the athlete's performance so greatly that he or she is ashamed to admit that he or she uses it. The system of random tests encourages only honesty, not a particular approach to drugs and medicine.

If used honestly by most athletes, the drug diary eliminates the first and second dilemmas. For the collective self-damage problem, note that making drug use public rather than secret changes behavior in three important ways. First, observing drug use gives the community of athletes the opportunity to create and enforce norms against specific drugs or procedures. Drugs would acquire reputations as "cheater's drugs," of which athletes should be ashamed. Second, public drug use allows drug-free athletes to recognize one another and engage in closed drug-free competitions. This allows spectators to decide whether drug-enhanced competition offers truly superior entertainment and allegorical value to drug-free competition. By voting with their feet and their TV remote controls, sports fans could then generate extra revenues and extra prestige for drug-free competition. Third, the choices of young athletes could channel physical ability, and hence higher reputations, into clean sports.

All this behavior works to one purpose: it transmits social preferences against drug use directly into the incentives facing athletes, thereby overcoming the first dilemma

of collective self-damage. The sorting of spectators and athletes into dope-using and dope-free communities would provide the dope-free community with a premium of reputational and material rewards. The dope-free athlete considering using dope for the first time would then have to reckon with the loss of that premium as he or she transfers from one community to the other. In equilibrium, if the premium for avoidance of a given drug is small, the incentive to avoid it is small, yet that would not be a problem because society apparently does not consider that drug "unfair." If the premium is large, the incentive to avoid it is as it should be, because society dislikes the drug. In short, honest drug diaries allow social preferences for drugs, properly informed by the medical community and the opinions of the athletes themselves, to be translated fully into the incentives facing athletes.

Considering now the second dilemma, that the regulation system encourages new drugs, note that the drug diary effectively removes all ambiguity from the regulatory system. No drugs are prohibited, so there is no need to define doping. Because there is no legal definition of doping and no prohibition, there is no extraordinary incentive to develop new drugs. That eliminates the second dilemma. It also produces an admirable legal clarity. The negative list pursues clarity by trying to be specific, but the drug diary does so by punishing secrecy directly. The diary clearly defines what is permitted in the bloodstream; anything else found there is not permitted. Secret drug use is a clear example of unfair play, and the authorities need not hesitate to punish it.

The third dilemma that relates to the possibility of ex post disqualification may not be solved by the drug diary. Its solution depends on the technology of enforcement. There would be a random testing system that would be more expensive than current tests, because one would test athletes not for a particular drug but for any drug not listed in their diaries. The total expense of testing would have to rise or the probability of detection would have to fall. The testing system would continue to encourage the development of drugs that are hard to detect. Practices that are impossible to detect, such as blood doping, would not be affected. Thus, there remains the possibility that secret drug use would become evident only after competition, and that winners would be disqualified. This would happen less frequently than it does now, because the drug diary solves the other two major regulatory problems. But the ex post disqualification problem would not be overcome entirely.

Even so, we believe that the protection of so important a public good as sports could justify the higher testing expenses that the drug diary system would require. We are also encouraged by the fact that, in practice, it is very hard for an athlete to keep a heavy drug regimen secret. This seems to be clear in the case of Irish swimmer Michelle Smith, whose victories are widely assumed, on the basis of credible circumstantial evidence, to have been assisted by some unknown drug use (Bamberger 1997). Sufficiently enforced, the drug diary would eliminate the first two dilemmas and thus offers a serious alternative to the current system. Although unable to eliminate the third dilemma, the drug diary system could make ex post disqualification much less likely.

COLLEGIAL ENFORCEMENT

We would like, however, to strengthen our case still further by proposing a second policy innovation to improve the targeting of tests. The nature of drug use suggests that athletes will know much more about the drug regimens of fellow athletes than any regulatory agent will; the Michelle Smith case provides clear evidence that this is true. Athletes certainly would have the incentive to obtain and publicize information about one another's drug regimens. In drug-free sports, they would have the additional incentive to keep others' drugs out if a mechanism for doing so existed. Finally, they would have access to behind-the-scenes information, including the rumor mill and the opportunity to observe suspiciously rapid spurts in performance, suspiciously frequent contact with disreputable doctors or companies, and suspiciously altered appearance.⁸ True, all of this would only arouse suspicion and a reputation for dirty play, neither of which is grounds for punishment. Yet, reasonable suspicions are an admissible basis for testing.

This kind of information would be used by the athletes themselves because they would have enforcement power. We propose to allow any two athletes who are currently registered by the sports association to demand a drug diary test of any third registered athlete. A test that revealed secret drug use would disqualify that athlete from the sport. The test could be demanded at any time, before or after competitions or even during training. The authorities would have the right to refuse the test if the challengers failed to present sufficient evidence of probable cause. To prevent frivolous challenges intended only to harry other competitors, there would be sanctions for false accusations. An accused athlete could avoid the test only by dropping out of competition. For a player secretly doping, the most beneficial response to an accusation would be to drop out before testing. A clean player would have nothing to fear from the test, of course, and would benefit from the false accusation sanction against his or her opponents. Thus collegial enforcement could drive dirty players (both drug users and false accusers) out of a competition before it started. This would be the policy's first blow against the *ex post* disqualification dilemma.

The collegial monitoring system offers two further strikes against that dilemma. On one hand, it greatly increases the efficiency of testing by making use of a truly vast store of information. A drug diary system supported by collegial monitoring need not involve more expensive or less effective testing than we now have.

Perhaps most important, however, collegial monitoring systems strongly encourage norms, which are the only weapon that will truly be effective against the often invisible practices of doping. Economic theory shows that social attitudes about right and wrong can be easily translated into individual costs and benefits whenever people get benefits from mutual cooperation (Bird 1995). Surely, a system in which athletes are allowed to challenge one another's integrity in public creates a situation in which mutual trust and respect are beneficial. Such a system would powerfully reward the maintenance

8. Note that the current system cannot make any use of the rumor mill as a source of information, because any new drugs one might hear about are, of course, new. But new drugs have not yet been banned, so there is no penalty for their use.

of a good reputation among one's colleagues. Moreover, psychological experiments show that people who interact under such conditions often internalize the community's norms (Dawes, van de Kragt, and Orbell 1990). Internalized norms would prohibit *all* unfair practices, whether observable or not, where unfair is defined not by the regulators but by the athletes and the public. By encouraging internalized norms, collegial monitoring would eliminate doping in sports. In doing so, it would return the final outcome of virtually every competition, except those rare test cases, to the field of play where it belongs.

In summary, a drug diary system enforced by the athletes themselves would make drug use public and create many channels for transmitting the anti-drug views of athletes and the public into the incentives of individual athletes. Compared to the negative-list system, it offers far more effective regulation at far less cost.

EVIDENCE FROM OTHER REGULATORY SYSTEMS

OCCUPATIONAL DISEASE: INCENTIVES FOR WEAK ENFORCEMENT OF LISTS

We have claimed that the negative-list system encourages drug use, even if authorities do everything in their power to combat it (the Orwellian scenario). But perhaps the authorities have other incentives. Occupational safety is regulated in many countries by a list of diseases (Barth 1980, 249). The list states which diseases can be credibly claimed to have been caused by work in a given job. A worker diagnosed with a disease on the list can then claim compensation from his employer.

In practice, such lists are quite short, for reasons that are easy to understand. A short list may not do much for worker safety, but it certainly soothes the consciences of regulators and employers. The job appears to be safe. Of course, workers can mistrust employers who simply announce that a workplace is safe. However, it is not employers who construct the list; rather, the state does so as part of occupational law. It appears that the state has constructed occupational disease lists, at least partly, in accord with the interests of employers and regulators, and that is why the lists seem short.

Moreover, once a list has been published, it changes very slowly. This is not surprising given the real uncertainty involved in tracing the cause of a disease to a particular job.

In the case of doping in sports, national-level regulators and sports administrators do rely on international bodies to create the negative lists. One suspects, therefore, that the current list is too short and changes too slowly (Berendonk 1992, 305). Asking the state to ratify the anti-doping list would not solve the problem (Wagner 1992), because the state would simply satisfy the secret interests of the sports associations and declare a short list. The history of the lists that define occupational diseases tells us that it would be extremely difficult to update an anti-doping law (Irlinger et al. 1994). Rather, the cat-and-mouse game would continue indefinitely. Regulators would point as evidence of clean sport to the short list of drugs and to the number of expulsions and disqualifications, which under negative-list regulation are many. Indeed, some have argued, ludicrously, that the occurrence of only two drug disqualifications at the

Atlanta Olympics testifies to the cleanliness of the games (Bamberger and Yaeger 1997). In fact, this is evidence of the opposite.

COMMON POOL RESOURCES: EVIDENCE OF PERSISTENT SELF-ENFORCING INSTITUTIONS

In *Rules, Games, and Common-Pool Resources* (1994), Elinor Ostrom, Roy Gardner, and James Walker provide a wealth of empirical and experimental evidence that unregulated communities can adequately manage the CPR problem. The particular factors that seem to encourage the development of good institutions include two that are most interesting here. First, the users of a CPR should be allowed the freedom to design and modify their own enforcement systems. Second, the best systems rely on the monitoring of users by other users. This second feature has the advantage that it maximizes the ability of the system to identify violations, and it also encourages the development of proper norms.

The lesson for doping is obvious. Rather than rely on central regulation, sports associations should encourage athletes to design and then implement their own enforcement systems. Rules should be monitored by the athletes and be considered part of the game rather than a question of formal law. Our institutions, obviously, are entirely in this spirit and can look to real-world examples of successful management of everything from meadows to fisheries for empirical support.

THE RULES OF GOLF: EVIDENCE THAT INTERNALIZED NORMS CAN ELIMINATE UNOBSERVABLE VIOLATIONS

Enhancing performance with drugs is not unlike enhancing performance with equipment. In golf, minute and virtually invisible alterations in equipment can have major effects on the outcome of the game. The international regulators of the sport, the Royal and Ancient Golf Club of St. Andrews (hereafter St. Andrews), enforce extremely detailed restrictions on allowable equipment. For example, the grooves on the face of a club can be no wider than 0.035 inches, about 0.9 millimeters (Gallacher and Wilson 1993). St. Andrews does not have a system of random equipment tests. Instead, manufacturers of new equipment submit their designs to St. Andrews, which then announces which designs have been banned. This is a negative-list system without tests, but it seems to work. Banned designs do not appear in tournaments. The ex post discovery of equipment violations and the consequent change in tournament outcomes are virtually unheard of in golf.

Ex ante equipment violations are not unheard of, however, but these stories only illustrate the effectiveness of golf's enforcement institutions. An official from the United States Golf Association (USGA)⁹ tells of an amateur player who, upon approaching the first tee in a competition, was discovered to have improper grips on his clubs. The discovery was made by a fellow player who simply took a very close look at the clubs. The competitor appealed to an official, and the player in violation

9. Personal communication with John Morrisett, Director of Rule Enforcement, USGA, March 1996.

was immediately disqualified. In a 1977 case, Larry Nelson was having his irons remodeled just before the prestigious U.S. Master's Tournament. His equipment manager noticed that the grooves on the clubs were too wide. Nelson immediately reported the equipment problem to the officials and was granted time to correct the violation. As the violation became public record, however, many of the other golfers had their clubs checked, and some of them also had to change clubs. Nevertheless, all the players had legal equipment when the competition began.

Evidently golf's equipment rules are followed. What distinguishes them from anti-doping rules? First, there is not much difference in terms of the observability of infractions. Although many specifics of golf equipment design are visible if one takes a close look, others are virtually invisible. Golf's rules succeed for both, however.

We think one factor explains much of this success, namely, the fact that golfers monitor the rules of golf themselves. In a golf round, a great deal of play occurs only under the eyes of the players. A momentary brushing of the ball, an inadvertent step on the green, a muttered piece of advice: all are grounds for penalties even if no official observes them. Players are expected to report violations to the nearest officials, and the officials give a ruling. Therefore, every time a piece of equipment is used, it is "tested" as other players take a look. Each such test is cheap and inaccurate, of course, but because there are hundreds of tests, the probability of detection is high.

The high detection probability at least can explain the success of rules against observable equipment violations, like club grips, but it does not explain success against invisible ones, like grooves. Evidently, something about the rules system encourages golfers to report unobservable infractions *voluntarily*. Such behavior can only be explained as the result of the norms of fair play, which golf's rules apparently must encourage in some way.

Indeed, there appears to be an obvious, powerful, and official mechanism of norms enforcement in golf, called *gamesmanship*. Gamesmanship is the practice of making rules challenges against other players at critical times, and is a well-honored part of the strategy of golf.¹⁰ It is also a direct consequence of golf's collegial monitoring system. In the hands of athletes, rule monitoring becomes more than a regulatory system; it becomes part of the game itself. This allows athletes to use their own behavior to enforce the norms of the athletic community. Golfers with bad reputations can expect many negative consequences: frequent challenges, stress on and off the golf course, and, eventually, bad performance. Moreover, bad golfers can expect that their own challenges are given little credibility. Golfers with good reputations enjoy calm playing conditions and great credibility when challenging others. One way to get a good reputation is to report an invisible rules infraction voluntarily. When Nelson handed over his irons, therefore, he had good reasons: he cemented for himself a reputation for fair play and thereby obtained a future of hassle-free, high-power golf.¹¹

10. In the 1995 Ryder Cup matches in Rochester, New York, Spanish golfer Seve Ballesteros deliberately harried one of his opponents over the following issue: was an obstruction that the opponent had brushed away from his ball a leaf or an insect? Ballesteros was widely admired in the media for this piece of gamesmanship, a skill for which he apparently has an impressive reputation.

11. Another example of norms and athletes can be found in baseball. Players can conceivably put strange substances on the ball before they throw it, which produces an erratic flight. They can also fill bats with spongy material like cork to make the ball fly farther when struck. These invisible alterations are enforced

Would gamesmanship work for doping? The two cases appear to be very similar indeed. The drug diary would make most drug use visible, just as most golf equipment is visible. The collegial enforcement system would differ only in that doping would have to rely on major challenges that are relatively rare, whereas golfers also have access to a minor-but-frequent challenging strategy. The two cases are similar enough, however, that golf's success lends substantial real-world credibility to the policies we propose.

GETTING FROM HERE TO THERE

Ostrom's (1990) work suggests that the best starting point for reforming doping regulations is with the athletes themselves. If experience with CPRs is any guide, a meeting of the top athletes in a sport could create a workable and effective regulation system, if given proper advice from experts in law, medicine, and (not least) social science. By lending their prestige to the process, these constitution-making athletes would legitimate the anti-doping system for other athletes. This in turn would encourage the swift creation of anti-doping norms.

Before a body of self-regulating athletes could be convened, however, significant obstacles would have to be overcome. These arise from the fact that the current system serves to benefit some very powerful interests, and, after all, the governing bodies of international sport are not chosen democratically; they cannot be expected to respond swiftly to public pressure. More important actors include the sports medicine industry, which benefits in several ways from the current system. Drug makers and doctors benefit from the demand for new drugs, but also from the demand for blood tests and assessments of new drugs. Lawyers benefit from the litigation that drug testing produces. Sports associations benefit from the ability to manipulate drug lists to produce an image of "clean sports," and from the very need for regulators that command-and-control regulation creates. Corporate sponsors and team owners benefit from the constant flow of new and amazing feats that uncontrolled drug use provides.

Moving from central regulation to decentralized self-monitoring will be feasible only to the extent that these actors look beyond their immediate interests, by giving substantial consideration to the well-being of athletes and the integrity of sports. Unfortunately, a more thorough reform of international sports, perhaps a wave of democratization, seems impossible to imagine.

CONCLUSION

We have argued that negative-list regulation of performance-enhancing drugs is associated with three dilemmas. First, like any CPR, drug use is a dilemma of collective

by a collegial system, in which the managers of opposing teams have the right to demand inspections of suspicious equipment. In the sensational "pine tar incident," George Brett's bat, and his home run, were disallowed because the bat had too much tar on it. Some tar is allowed, and there was lengthy debate about the propriety of the ruling in the case. As in golf, however, such violations are exceedingly rare in baseball. Detecting a corked bat requires sawing the bat in half, yet virtually no bats are corked.

self-damage. Each athlete has the incentive to use drugs no matter what others do. Yet, a world in which all athletes use drugs is bad for the athletes and everyone else. The situation cries out for a regulatory response. The negative-list system, however, generates a second dilemma because it only encourages drug use. Drugs that have not yet been banned can be used freely to enhance performance. Drug use thus remains rampant in sports. The third dilemma is that strong enforcement of negative lists only invalidates sports, moving the final decision in the contest from the playing field to a press conference some days or weeks later.

After considering some alternatives, we have proposed a new regulatory system that definitely eliminates the first two of these dilemmas and may eliminate the third. A drug diary system encourages honest drug use and discourages secret drug use. As a public matter, drug use in sports would become subject to social pressures, such as athletic norms and the entertainment decisions of spectators. These social pressures, we argue, would make drug use less beneficial to the athlete and thus overcome the first dilemma. Because our system bans cheating but not particular drugs, the second dilemma is automatically overcome. We also propose a system of collegial monitoring, which we argue can effectively enforce the drug diary. Together, drug diaries and collegial monitoring would encourage anti-doping norms that may be powerful enough to eliminate improper drug use, even when unobserved. This would overcome the third dilemma as well.

We are less hopeful on this last point because there will always be test cases, athletes whose misperception of the power of norms enforcement leads them to use drugs unfairly. Yet, we believe that such violators would eventually be caught, or, at the least, be so harassed by their fellow athletes that they would find doping altogether too costly. As a result, the prevalence of drugs in sports would be much less under our proposals than under the current system. At the very least, our system discourages rather than encourages new drugs, and it encourages rather than discourages the social choices and norms that might eliminate all drugs. The social benefits of such successes in the war against doping in sports are so high that even very expensive testing in support of our system would be well worth the cost.

Perhaps it goes without saying that medical science provides CPRs for everyone, not just athletes. The problems of performance-enhancing drugs will eventually appear in the examination room as forcefully as they do now on the playing field. Socially disastrous procedures like cloning have been banned, but does anyone believe that banning them also controls them? The only hope lies in informal enforcement; it might be a slim hope, but it is the only hope.

Of course, informal systems are free to determine that bad things are not really bad, and no enforcement systems may evolve. In the world of sports, the public and athletes may decide together that drug use is nothing to worry about. But if this is so, then the current system of regulations is seriously out of touch with society's wishes and should be reformed or abandoned anyway. Of course, the secret use of drugs encouraged by the current regime makes it impossible to determine what society really thinks about drugs and sports. The consequences of drug use remain as secret as the use itself. Under the system we propose, those who believe those consequences would be negative will have every opportunity to make their case, by providing athletes and spectators with

real-world examples of the health consequences of drug use. If properly informed about the extent of drug use and its effects, sports would be free at last to evolve into the proper state, where the mix of health and performance meets standards of common sense.

Our proposed system may seem to be a radical departure from current practice, and one might wonder whether it would really work. But there is really nothing radical about it, because it is already used to enforce other rules in other sports. We have much evidence that those rules get enforced. While this article was in its first draft, a small story appeared in the local newspaper in Rochester, New York. It involved a local golfer, Jeff Sluman, who had been competing in the Bay Hill Invitational Tournament in Orlando, Florida. About halfway through the tournament, Sluman hit his ball into the water. Following the standard rules of golf, he took a new ball, dropped it on dry land, and played on. Later, reviewing the day's play, Sluman discovered that he had dropped his ball incorrectly. He went to the tournament officials and had himself disqualified. By doing so, he missed a chance to earn tens of thousands of dollars: he was only two strokes behind the lead at the time.

This story powerfully illustrates the feasibility of collegial enforcement of invisible rules. The facts of the case speak clearly: Sluman's error was detected only by himself, and his disqualification was incredibly expensive for a golfer who rarely wins tournaments. His choice is startling from a simple economic point of view; if it was rational, it can only be because of the existence of significant costs imposed by a norms system. Those who disagree and claim instead that collegial enforcement cannot work must offer a different characterization of Sluman's incentives, or they must hold him irrational. The fact is, golf's competitors follow the rules, seen and unseen; the fact is, their fidelity is not particularly newsworthy. Sluman's choice was virtually ignored by the press, and became apparent to us only because one of the authors happens to live in Rochester.

The tale reveals not only that our system can work; it also shows that such systems are a thoroughly mundane and ordinary part of the enforcement of many sports rules. Why not doping?

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