

Soon Drugs May Make Us Smarter

But If We Use These 'Brain Steroids,' Will Nobel Laureates Need Urine Test?

By Michael Schrage

IF SPORTS ARE a microcosm of real life, then the controversy surrounding athletes who use drugs to sharpen their competitive edge offers a disquieting vision of what's in store for people who live off their wits.

As surely as anabolic steroids can temporarily boost athletic performance, research in the chemistry of the brain will yield drugs that can boost human memory, learning and thinking.

"The basic science of neuropeptides and neurotransmitters . . . is exploding at the present time," says James L. McGaw, director of the Center for the Neurobiology of Learning and Memory at the University of California at Irvine.

"This is space travel of a different type," says Dr. Herbert Weingartner, chief of cognitive studies at the National Institute of Mental Health. "We're sitting on a revolution that rivals quantum physics in the 1920s."

Research in mental disorders such as Alzheimer's disease is yielding valuable insights into the chemistry of memory. Many scientists are growing much more comfortable with speculation that a new generation of neuropharmacologicals can enhance normal brain function.

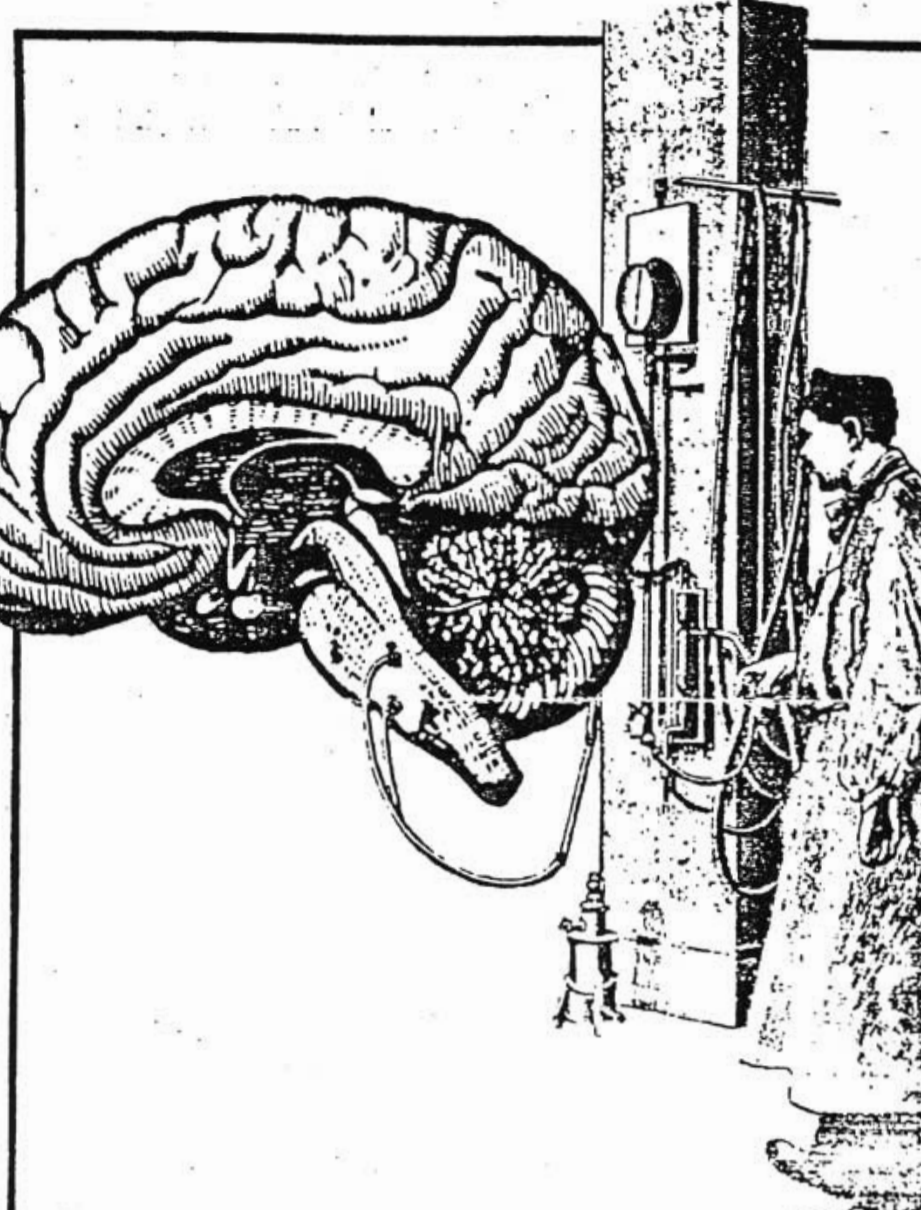
"It's not as if this is pie-in-the-sky," says McGaw.

Certainly by the turn of the century, McGaw, Weingartner and other scientists predict, this revolution in science may spawn a revolution in pharmacology creating pills that are the brain's equivalent of steroids — with all the moral, ethical and practical problems that implies. They will alter mental competition as radically as steroids and similar chemicals have altered sports.

Make no mistake. Those sports drugs aren't placebos. They have, for better and worse, a definite impact on an athlete's physiology and performance. Both their effectiveness and pervasiveness has created a situation where virtually no winners or world records in international competition can be sanctioned until the athletes have submitted to a urinalysis.

If relatively safe drugs to improve human memory and cognition seep into the market,

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what will happen when they, too, are viewed as productivity tools and used accordingly? Will those drugs be giving their users an unfair advantage over their competition?

What we could be facing is pharmacology's version of the information revolution: instead of relying on personal computers to process information and aid decision-making, people may turn to specially designed chemi-

cals to improve their internal information processing abilities.

On one level, there is nothing new in College students have been notorious taking amphetamines to stay up late at to cram or finish overdue term papers. ever, amphetamines have all the subtle a jackhammer when it comes to cog enhancement.

See BRAIN, C4, Col. 1

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'Brain Steroids' Pose Dilemmas

BRAIN, From C1

The drugs that science and the pharmacology industry will explore should be more finely tuned to the brain's own chemistry and may offer much of the benefit of the cruder drugs with fewer of the unpleasant side effects.

These new neuropharmacologicals will rely heavily on basic insights recently gleaned on how the brain works. Despite its image as a dry, computerlike device, the brain more closely resembles a sack of chemicals that are constantly interacting. Billions of brain cells — neurons — float in a sea of chemical message-transmitters. They continuously pulse — but only when a few thousand or a few million act in concert do interesting things begin to occur.

Brain scientists are learning more and more about the neurotransmitters — the chemicals that tell the neurons how and when to pulse in sequence. It may take two or three different chemicals acting on each other or a neuron to create a particular signal, but research is determining what specific neurotransmitters yield specific reactions in the brain. As scientists discover these chemical ensembles, they are building the elements of drugs that will be able to target specific sites in the brain and generate specific behaviors — such as improved memory — in people.

There will no doubt be a huge market for relatively benign drugs that can sharpen concentration or enhance learning and memory. Pills like that would sell all over the world. But what does it lead to?

Will a Soviet chess team be forced to submit to urinalysis?

What of the millions of high school students taking their SATs? The pre-med students taking their MCATs and organic chemistry finals? Law school graduates taking the bar? Accounting students after their CPA exams? Should they all be required to go to the bathroom under supervision and bring their urine back in a cup?

Should it even matter that students and/or professionals in tough, competitive mental situations turn to drugs for a quick boost in cognitive productivity?

One could argue that, as global economic competition intensifies and people feel increasing pressure to excel in their jobs,

there will be a trend towards this sort of drug use.

Just as preeminence in computer technology gives this country a competitive edge over Europe and Japan in the global marketplace, the possibility that pharmacological tools may also yield productivity gains could be explored.

Perhaps the Nobel laureates of two or three decades hence will be using drugs to enhance their mental abilities as they do their research. Is that bad?

There's a certain logical evolution to this: the 1960s saw drugs as tools for "consciousness expansion" and chemical pleasure. Remember Timothy Leary's psychedelic "tune in, turn on and drop out" credo of pharmaceutical self-indulgence.

The 1980s and 1990s are likely to be different. Perhaps there has been too much emphasis on the mood-changing quality of today's so-called recreational drugs and not enough on the fact that they can play a role in affecting people's performance.

Puritan notions of drugs as a way to escape reality are collapsing in a society where people are looking for virtually any edge they can find to succeed. Yesterday's searches for personal pleasure may be superseded by tomorrow's quest for improved personal productivity.

In the roccoco phrasing of one doctor, it is the difference between "psychotropic hedonism and psychopharmacological Calvinism."

"This is sort of happening now with cocaine," says Dr. Sidney Cohen, a professor of psychiatry at UCLA who has studied drug-abuse patterns for the National Institute of Drug Abuse. "Cocaine usage is not entirely for euphoria. Some executives are using a snort of cocaine to make them 'think better' before they go into a meeting. May be they're even using it successfully until they start overdoing it."

It may well be that "thinking better" is simply a rationalization to explain away a cocaine addiction, but several neuropharmacologists and psychologists point out that many psychoactive drugs already can improve people's cognitive performance — the ability to concentrate, for example — albeit at the price of undesirable side-effects.

After researching the question, says Harvard University psychiatrist Norman E. Zin-

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berg, "we got the impression that these drugs were more effective [at cognitive enhancement] than most people would like to admit."

The analogy to the sporting world still holds, people aren't just using drugs as medicine, they are using them as a tool to improve normal performance.

Because of that crucial distinction, the Food and Drug Administration, the agency that regulates the drug industry, says it will be giving careful scrutiny to the cognition enhancers.

If you can go from six tries to four in remembering a list after taking a drug, says Mr. Paul Leber, director of the division of neuropharmacological drug products at the FDA's Office of Drug Research and Review, "is that worth anything? What are the attendant risks?"

He points out that "Drugs have the action you want, the actions you don't want and the actions you don't know about. You can do things for short periods of time, but what's the long-term cost?"

standards regarding potential side-effects. However, the agency might well approve such drugs if their benefits could be demonstrated.

There are more immediate and practical considerations as well. "The brain resists frequent medication," says Dr. Floyd E. Bloom, director of the division of preclinical neuroscience and endocrinology at Scripps. "It develops a tolerance for drugs."

Though Bloom dislikes the idea of drugs to aid normal cognition, he concedes that "it would be very likely that we could find safe stimulants for arousal for short periods for people like space shuttle pilots or nuclear power plant operators"

In essence, the scientific and technological underpinnings for this pharmacological revolution are there — the real questions seem to revolve around the cost-benefit trade-offs for the individual who would take these drugs.

But what does the society do? Does it tell its citizens that, even though cognitive enhancers might make people more productive and more effective on their jobs, they are

ences and Ethics in New York, points that endorphins — a chemical nature found in the brain — has an opiate structure. "What's natural and unnatural longer holds in this context," he says.

That taking such drugs would be unethical? Why is someone taking a cognition taker any less ethical than someone takes a vitamin to better manage their performance?

The answer to these questions may have more far-reaching impact on society how such bioethical debates on organ plants and test-tube fertilization are solved.

What we're talking about here is a uncomfortable intersection between science, technology, values and economics. What society chooses to shackle the new biology in regulations or allow it to be distributed according to free-market there's no question that our notions of discipline, work and individual effort change as a result.

The sports model offers a chilling vision for the future. Despite the establishment's efforts to eliminate drug use, the shows no sign of going away. It's