

June 19, 2005

SUNDAY TIMES

Get a better mind from the chemist
Jonathan Leake, Science Editor

RESTRICTIONS on the use of brain-enhancing chemicals that can improve intelligence, memory and decisiveness may be removed.

The idea is among the most controversial yet to emerge from the Foresight programme of Lord Sainsbury, the science minister, which attempts to predict how technologies and discoveries might affect society.

Its report, written by some of the country's leading brain researchers, will say that it is inevitable that such drugs will be made available on demand and without prescription.

It has been dubbed "cosmetic neurology" or the "nip and tuck" for the mind by Dr Anjan Chatterjee of the University of Pennsylvania.

Writing in the *Annals of Neurology*, Chatterjee says that amphetamine drugs that help stroke patients who have suffered partial paralysis might assist healthy individuals to learn to swim or play the piano.

The first generation of mind-enhancing drugs include Ritalin and Modafinil. Although intended to treat disorders they have been adopted by healthy people across the social spectrum because of their ability to enhance performance.

Trevor Robbins, professor of cognitive neuroscience at Cambridge University, who co-led the Foresight report, out next month, said the subtlety, power and often trivial side-effects of modern mind-enhancing drugs

meant it may become impossible for the government to curb growth in their use.

"Many of these new drugs seem to have few harmful side effects and are not addictive while also offering particular benefits," he said. "Once people learn about these drugs they will want to use them. The question is: is it right to try to stop them or should people be free to choose?"

Robbins said he was raising the issue rather than advocating liberalisation. However, even raising the possibility of making it easier for people to buy mind-enhancing drugs is likely to prove controversial.

The report's authors point to a recent study of American college students which found that up to 20% regularly use Ritalin before exams, even though they have nothing wrong with them.

Ritalin was originally marketed as a treatment for children and adults with attention deficit or hyperactivity problems but, as with many drugs, was rapidly adopted by alternative users.

Many students found it helped them concentrate and calm down before exams. The drug is now frequently sold illicitly on campus and is widely available on the internet.

In Britain that pattern is being repeated with Ritalin prescriptions soaring from 2,000 a year in 1990 to more than 150,000

by 2002. There are also reports of it being sold and swapped in playgrounds.

The picture is similar with Modafinil, generally prescribed for the treatment of narcolepsy — a condition where people suddenly fall asleep. It has, however, become far more popular for its ability to help people think clearly and make decisions, especially when tired.

Business executives with busy schedules are said to be among the growing number of users. Barbara Sahakian, professor of clinical neuropsychology at Cambridge University, who has also worked on Sainsbury's study, described how she had been casually offered Modafinil by academic colleagues at a conference to help her overcome jet lag.

"I refused but it shows how attitudes are changing," she said. "We are getting to the stage with these drugs that there are so few side-effects and such clear benefits that they will become widely used by society for social reasons as well as medical ones. It will be like having a cup of coffee."

Such a prospect has proved enticing for pharmaceutical companies, which are pouring funds into research on brain enhancement. Among the results of such research is another class of drugs known as ampakines, which seem to have an ability to enhance memory.

Their development illustrates how detailed and exact brain science has become. Ampakines are being designed to amplify the chemical reactions that take place at synapses — the junctions between nerve cells — in the parts of the brain where memories are laid down.

Martha Farah, professor of psychology at Pennsylvania University, believes such chemicals cannot be restricted, because everyone will want them.

In a recent review she co-authored in the journal *Nature Neuroscience* she said: "Humanity's ability to alter its own brain function might well shape history as powerfully as the development of metallurgy in the iron age, mechanisation in the industrial revolution or genetics in the 20th century."

Other researchers are more sceptical. In his recent book *The 21st Century Brain*, Professor Steven Rose, director of brain and behaviour research at the Open University, said: "These new technologies open the way to mind manipulation and to the creation of a society that has indeed moved beyond freedom and dignity."

Sainsbury was unavailable for comment.

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