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Clearing the head

Fay Burstin

ALMOST all of us do it every night for the same amount of time.

But even after centuries of study by scientists and philosophers alike, we still know very little about why we dream and what it means.

And if a theory by a Perth-based neuroscientist is to be believed, we can forget Sigmund Freud's ideas that dreams reveal our secret desires or Nobel Prize winner Francis Crick's theory that we dream to trash spurious memories.

According to Curtin University neuroscientist and mathematician Dr George Christos, dreaming is an important biological function experienced by

most animals.

"If dream content was so important, why are we not conscious of our dreams and why don't we remember them?" he said. "And why do most babies dream for

about five hours a night while most adults dream for about two hours, irrespective of psychological distress?"

Dr Christos's answer, based on computer simulation of mathematical models, is that dreaming provides the foundation for all new learning and creativity.

"When we dream, we unlearn instead of learn, to help rid the brain of unwanted irrelevant memories like how many cups of coffee we had the previous day," he said.

"Dreaming also weak-

ens strong memories to alleviate obsession.

"But I believe the main function of REM sleep is to generate new states in the brain.

"These states are what enable us to learn new things the next day, to adapt to new situations, and to be creative."

In his book *Memory and Dreams: The Creative Human Mind* (University of NSW Press, \$34.95), Dr Christos explains that we dream about our own memories. "You dream about things in your head and I dream about things in my head," he said.

"We also generally dream about things we have done or encountered in the past few days because these are our strongest memories.

"But they don't really

mean anything because they're stimulated by random input from the brain stem and are not amenable to psychoanalysis."

Professor Richard Silberstein, from Swinburne University's Brain Sciences Institute, said Dr Christos might have a point but suggested the role of sleep and dreaming was more complex.

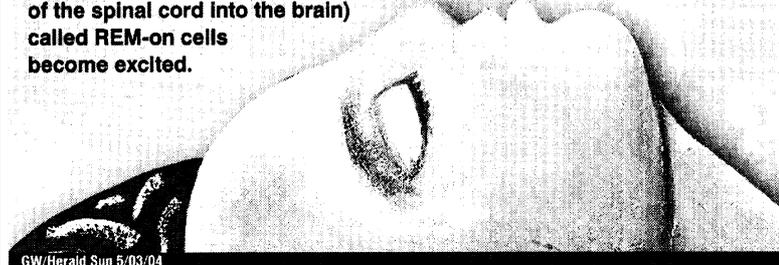
"There is now increasing evidence that we continue to process information, such as the day's events and problems, during sleep, whether we dream or not," he said.

"In other words, 'sleeping on it' improves your ability to solve problems."

Net link: www.maths.curtin.edu.au/~christos

WHAT HAPPENS WHEN WE DREAM?

- 1** Apart from heart and lung functions, our brains are mostly disconnected from our bodies and the environment. We have no sensory input - that is, our eyes and ears stop sending signals to the brain.
- 2** We enter rapid-eye-movement (REM) sleep.
- 3** A small set of cells in the brain stem (the extension of the spinal cord into the brain) called REM-on cells become excited.
- 4** REM-on cells stimulate the brain through the same channels we normally receive sight and sound.
- 5** Input from REM-on cells is unstructured or random, which explains why dreams can be bizarre.
- 6** The brain processes this input as if it were real.



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