Mind maps

From Ralf Dahm, Institute of Molecular Biology
Creating an accurate map of the brain's connections is certainly a monumental undertaking (5 February, p 32) and Douglas Fox rightly compares it to the early days of genome research. Like the sequencing of the human genome, which was long believed to be impossible, mapping the entire human brain will be greatly aided by advances in technology.

There is, however, another parallel between these two fields. While obtaining the complete sequence of the human genome undoubtedly represented a major milestone in biomedical research, it could not explain the full complexity of how we develop, age or become ill. Only now are we beginning to understand the many roles our genes play.

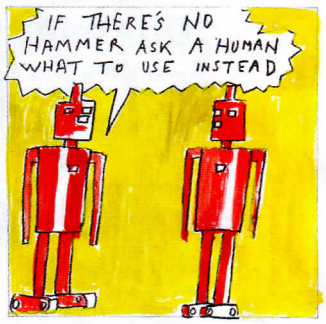
The same is likely to happen with the connections of the brain. The mere presence of a synapse between neurons is only part of what is needed to understand how these cells communicate with each other. There are many factors that influence the role a synapse plays in a neural network, all of them difficult, if not impossible to deduce from microscopy images.

These limitations should not deflect attention from the potential benefits of a brain-mapping project, such as insights into how our mind works, or possible treatments for neurological disorders.
Mainz, Germany

I want to be like you

From John Kioustelidis, National Technical University of Athens
In spite of the impressive achievements of artificial intelligence in controlled environments, no mathematical technique of information processing will ever produce an "intelligent" robot able to perceive implicit possibilities in a non-controlled environment (29 January, p 28).

The reason is simple. We store concepts and memories of objects not as combinations of logical properties, but as patterns of interaction with our environment. For instance, when lacking a hammer, we will almost instantly and without extensive



analysis look for a heavy, solid object to use instead.

All objects are stored mentally as hierarchies of interactive properties, progressing from the general to the more specific. In order to perceive things in the way we do, we have to gradually collect increasingly specialised interactive experiences over a long period of time. This is how children learn to handle objects, and it would be the way in which we could create robots capable of thinking like us, too.
Athens, Greece

The game's afoot

From Lyman Lyons
The gushing praise in your publication and elsewhere for IBM's Watson supercomputer seems to me unwarranted (19 February, p 6). Watson did indeed win the *Jeopardy!* matches, but I became suspicious while watching them as I could answer a sizeable percentage of the questions, and I am sure the two human competitors could have answered far more. So why did Watson dominate?

Simple: contestants have to wait until the question is completely read out and a light has come on before they can press their buzzer. The contestant who signals first gets to answer. It turns out that Watson is faster than a human at this; the two human contestants never had a chance to answer a question that Watson had decided to answer. In fact, Ken Jennings was visibly frustrated time and again while pressing his buzzer, as he obviously knew the answers.

A fair contest would pit the two human champions against Watson in a match that would eliminate the computer's mechanical advantage. Otherwise, the only insight we will glean from these *Jeopardy!* competitions is that computers are faster than the human nervous system in responding to a stimulus. Big deal.
McFarland, Wisconsin, US

Stellar seed

From Guy Cox
I was horrified by the proposition that we should send life to other planets (5 February, p 40). Why anyone should seriously favour contaminating ecosystems on other planets with terrestrial bacteria I find hard to understand.

Let's not forget that it is likely that such ecosystems do exist. Organic compounds are common even on meteorites and comets, so life is likely to arise on a planet if it is even remotely Earth-like.

Admittedly, one unusual feature of our planet is its oversized moon. The tides it creates were probably instrumental in getting life out of the oceans and onto land. One may expect, therefore, that life elsewhere may be confined to water.

This has an ironic corollary. Aquatic life, however intelligent, would have little use for radio waves, making it likely that most of our attempts at interstellar communication are misdirected.
Sydney, Australia

From Leo Passaportis
I was surprised that your feature about sending life to other planets did not mention the debate surrounding the Russian Federal Space Agency's Phobos Sample Return Mission. This aims to send live bacteria into the solar system for the first time, apparently in

Enigma Number 1637

In-laws

SUSAN DENHAM

Four pairs of siblings were great friends right through school and eventually the eight (all mentioned below) paired off in man-woman partnerships and got married. They had no other siblings.

Alan has two brothers-in-law, Brian Long and Eleanor Short's husband. Fiona has no sisters-in-law. Mrs Tall's brother Colin states that his sister-in-law's sister's sister-in-law is Geraldine. Hannah's sister-in-law's brother's sister-in-law is married to David.

Name the four married couples (eg: you might have Alan and Eleanor Long, and so on).

WIN £15 will be awarded to the sender of the first correct answer opened on Tuesday 12 April. The Editor's decision is final. Please send entries to Enigma 1637, New Scientist, Lacon House, 84 Theobald's Road, London WC1X 8NS, or to enigma@newscientist.com (please include your postal address).
Answer to 1631 The number atop Joe's pyramid is 98
The winner Martin Hooper, Burton upon Trent, Staffordshire, UK