**Friday
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TOMORROW'S PEOPLE

Daily News Brief

Finding The Feel-Good Factor

By Mun Keat Looi

Better drugs or better relationships? This was the discussion of Thursday's plenary session on *Happiness?*. Richard Layard's studies of economic growth confirm that money cannot buy happiness. But you won't be able to buy a drug for it either, according to Professor David Nutt.

He says that current understanding of the brain is such that there could be significant new drugs for happiness within the next 20 years. But it won't happen. Even if pharmaceutical companies did invest, they would be unsure how to market them. Happiness drugs occupy the grey area between medicines and recreational substances. Where do we draw the line between therapy and lifestyle?

"We watch Friends rather than making friends"

- Nick Baylis

Nutt looked at happiness from the neurochemical perspective. He saw three states of happiness as viewed through mental disorders: unhappiness (depression); normal happiness through reaction; and pathological happiness stimulated by inappropriate content (mania).

Others said happiness was not so much to do with drugs or other technologies, but more about ourselves. Both Richard Layard and Nick Baylis emphasised the importance of human relationships: family, friends, colleagues and communities. According to Baylis, we are "using technology to consume happiness faster" and forgetting to experience reality for ourselves. "We must not demonise

Robots Take Over

By Helen Thomson

"Intelligence is the most powerful force in the universe," says Nick Bostrom, but for some, being the most intelligent creatures on the planet is simply not enough. Will developments in either the pharmaceutical or computer industries provide the solution for our perpetual quest to become 'smarter'?

We can already enhance ourselves in many ways. Education is a form of enhancement and forms the broadest basis for self-improvement. Even mundane processes such as getting a good night's sleep and exercise are also highly successful ways of improving one's cognition.

"We all want to improve ourselves," says pharmacologist Danielle Turner and in the pharmaceutical world, memory, alertness, and attention-improving drugs are increasingly available. One promising drug, Modafinil, appears to enable high performance functioning, with few side effects – arousing the attention of the military for use in defence and high-alert situations.

There are a range of techniques used to improve our brains, but as Bostrom points out, "just how far can a 3 pound lump of grey matter take us?" Not as far as economist Robin Hanson would like, and he believes that by mid century, "brain size will not matter because you will be distributed or run over a network and then [intelligence] will become very vast indeed." He proposes that computers will soon be powerful enough to recreate an artificial model of the brain which would simulate the same overall behaviour. Bostrom predicts that robots with such humanoid

Who Will Lose Out?

By Stella Papadopoulou and Steve Schifferes

The final plenary session on Thursday attempted to address the central ethical issue of life enhancement technologies – who will benefit from them, and whether they will be implemented in a just, fair and equitable way.

Critics have charged that life enhancement will be 'genetic genocide' that creates a race of superhumans and subhumans. Francis Fukuyama writes that "the first victim of transhumans might be equality itself." Bill McKibbon writes that such moves would "take the inequality gap right into the biology."

"*We are all disabled in some way*"

But ethicist Julian Savulescu argued that these concerns are misguided. He argues that fairness requires that we try to do as much biological enhancement as possible. In this view, there is no reason to assume that we will increase inequality by using the new technologies. Instead, we could choose to raise everyone up to a higher level of ability or cognitive function. He says that if justice is "the right to have a fair go," it means giving as many people as possible a decent chance of a decent life. Furthermore all sorts of conditions – only some of which our society defines as disability – could be tackled by the new techniques. "We are all disabled in some way."

He argues that the "bio-conservatives" are wrong because they are social determinists who think the way

The population is rapidly ageing in poor countries.

Day Four Events

0845-1030

Edmund Safra LT
The disappearance of nature versus nurture: how cognitive enhancement will blur the lines

Rhodes Trust LT
How does art or design practice speak about, and invent, the future?

LT 4
Existential risks: what's the probability of humanity going extinct in this century? Howcan we improve the odds?

1100-1230

Nelson Mandela LT
Governable?

1230-1330

SBS Entrance Hall
Lunch

1330-1500

Nelson Mandela LT
Governable?

1500-1600

Nelson Mandela LT
Closing Plenary

1600

Forum close and departure

Facing the World Ageing Challenge
By Mun Keat Looi

Ageing may be mankind's greatest achievement, according to the WHO's Alex Kalache. Yet we deride it or worse, ignore it. In previous centuries the challenge was simply to survive. We have succeeded in extending our lifespan beyond that of our ancestors, but we talk of ageing as a burden, an undesirable state of being.

The issue of ageing is constantly addressed to the developed world only. In fact, of the 600m people classified as elderly in the world, 2/3 are in developing countries. As world population rises, this proportion will only increase.

The fact that only six people attended this breakout group made a statement about ageing as an issue in the developed world. Ironically, the session aimed to tell us *Why Ageing is a Global issue and why the cost of ignoring it will be so high*.

The group spoke of 'active aging': ensuring that people remain active in old age, contributing to the economy and society. In some countries, the older generations are those who tie the country together, caring for family members and investing their pensions; contributors, not just recipients. Health and the maintenance of 'functional capacity' are key issues, with access to basic medicines and aids (such as glasses or hearing aids) of paramount importance.

But we must also create social security systems to ensure that those no longer able to function are cared for.

"We have a window of opportunity"

Before our population ages further, we have a window of opportunity to develop new policies. Otherwise we are in danger of overloading our children and grandchildren with a growing population of dependents.

Feel-Good cont.

our negative emotions," he stressed. Donald Bruce agreed "Christ was made perfect through suffering. It is part of what makes us human." Bruce warned against the disjunction between our goals and the ideals and values behind them.

Even if we agreed with Jeremy Bentham's philosophy that "greatest happiness for the greatest number" is the goal of civilised life, we'd still have to define happiness.

Baroness Susan Greenfield attempted to define the indefinable. Perhaps happiness is the passive receiving of pleasant sensations? Drugs have long been used for this purpose. But is happiness a healthy mind? The absence of suffering? And why do we enjoy 'letting ourselves go' or going 'out of control.'

Greenfield saw three types of happiness: the alleviation of suffering; active abandonment; and the feeling of fulfilment. We could achieve these through more technology, fundamentalist beliefs or increased consumerism.

Each achieves a sense of individual satisfaction or fulfilment, but never both together, as true happiness requires. Greenfield hoped we might find a fourth alternative; something akin to the 'Eureka' moment of satisfaction and fulfilment that scientists gain from their work.

Robots cont.

brains could take over menial tasks, resulting in a steep change in economic growth. Eventually the amount of jobs that robots can do more efficiently than humans will increase, creating a whole new way of living. "People will accept this rising tide [of robots] because they will own a fraction of it. We will have so much money from owning our share of the tide that there won't be a problem."

But this 'heaven' concept is juxtaposed by an opposing 'hell'. Some delegates asked, "what of those who don't own a share?" Hanson's ideas are suggestive of a futuristic 'Metropolis', but are they hypothetically desirable or practically unattainable?

We can be smarter, more informed, but maybe there *are*

"We all want to improve ourselves"

factors more powerful than intelligence - wisdom, instinct. However 'enhanced' we may become, we will never be able to 'upload' these characteristics, which would be a fundamental flaw in Hanson's grand design.

Losing Out cont.

society develops is predetermined. But it may be cheaper, safer and more effective to improve the lives of ordinary people by altering biology than by altering society, for example by raising IQ rather than by providing special education.

But in practice many new technologies are distributed unequally between people within a population. In China, for examples, although child vaccination became widely available 16 years ago, the vaccination rate varies a lot between different regions and groups. Zhao Yandong tried to explain the phenomenon by conducting a population-wide study across 11 Chinese provinces.

Yandong wondered whether it was affordability, accessibility or acceptability (or combinations of these) that accounts for the inequality. After conducting a survey of 44,000 urban and rural households he concluded that more children get vaccinated if they were born in a hospital than a community clinic.

The higher the education level of the mother the higher the chance for the child to receive the vaccine. By and large, children from rural areas are less likely to get vaccinated than those coming from an urban background.

So for China, and probably many other developing countries, your social standing has a big effect on whether you benefit from new technologies— or even old ones.

Building Public Trust

By Viviane Li

Someone once said, "for every expert, there is an equal and opposite expert." How should science soldier on in an accelerating world of uncertainties and scepticism?

Not only do we need to discuss the science of the future, we also need to discuss how we should discuss them! Our technological future is a product of many choices, therefore many versions of this future are possible.

So on whose shoulders should it fall on, and how do we identify and assess the many factors that come into play?

"Credibility will come when we make each other nervous"

With GM crop and other controversies, corporate science has nose dived in credibility. Scientists affiliated with corporations, and to a certain extent the government, are seen as less impartial with their agenda.

Presentations on technological possibilities usually left their applications for society at large to determine – some time in the future. We are postponing responsibility, passing the buck. Scientists want to pursue unbounded knowledge, then assume that society will be able to regulate these very complex issues we have concocted in consequence.

"If as a scientist, you want to establish an agenda, then you will need to take responsibility." Credibility will follow when we take "responsibility to make each other nervous."

Can Scientists Prevent Scandals?

By Helen Thomson

Creating international standards on the ethics of stem cell research has become especially important following the recent scandal involving the world's most successful cloning scientist, Prof Woo Suk Hwang, whose team fabricated at least nine of their 11 stem cell lines.

But it is unrealistic to try and change the laws in every country? A more suitable alternative has emerged involving the international collaboration of scientists.

Last month, researchers and ethicists from 14 countries announced recommendations for ethical conducts in embryonic

stem cell research at a three-day conference at Hinxton.

"It would be nice if we could have one governing body so that we can all conform to one ethical model that we can all agree on… a standard procedure for everyone to follow," says Julian Savulescu, "but I think this is unlikely to occur. One of the strategies would be to make the protocols and results publicly accessible so the world can scrutinise the standards. For too long scientists have wanted to stay in their laboratories, and now they're stepping forward and willing to take criticism on the chin."

The scientific community wanted to demonstrate that stem cell research was ethical regardless of the individual laws. They also wanted flexible regulation, in order not to lock researchers into a set of fixed laws.

"The degree of agreement across diverse nations was impressive," says John Harris also attending the conference. The recommendations culminated in a smorgasbord of clearly articulated values in ethical and legal policy, which will hopefully address the restrictions and fears that are currently hampering progress in stem cell research.

Slippery Cyborgs

By Viviane Li

If you are worried about the slippery slope of human enhancement, the *Cyborgs, Citizenship and Democracy* breakout group, chaired by James Hughes, wanted to set an agenda to reduce the incline.

Cyborg democracy envisioned techno progression crossing the line, from therapy to enhancement, and promotes technocitizenship in a positive light, providing enhancements are controlled democratically. We will need regulations to stop serial cyborg upgraders from getting out of control, and become what Michael Jackson is to plastic surgery.

"We will need regulations to stop serial cyborg upgraders from getting out of control"

To democratise the technology of the future, it was proposed that some enhancement therapy should be available as a basic right. As well as establishing new regulations, we will also need to look at modifying current laws. For example, there should be no intellectual property restrictions

on the use of our own genetic code, even if it was designed. However, this would mean corporations need to rethink the way they currently profit from technology through Patents. The rights of individuals should be established. These include the use of technology to control our own bodies and minds; how to determine and regulate the right to more life and ability.

There are many more problems in getting this scenario ready, before the technology catches up with us, full steam. Can we negotiate the bends with the brakes on, and make sure we don't skid off the road?

With well over 400 unique visits to the discussion board yesterday, many from outside the UK, it is clear that a wider audience is interested in this Forum. Here are some quotes from today's online discussion.

"Enhancements are simply another form of technology, and just like with any technologies we have seen in the past it depends on how we use it that would determine if they could make you a better person or not. There is nothing intrinsic about the enhancements that will make you a better person or not. They are simply technologies." -Theo N. Lyone on *enhancements = better?* in **General Discussion**

"One could imagine enhancements that increase the capacity to act morally. Imagine intelligence enhancements increasing our ability to predict the consequences of our actions, how others feel and our ability to control our behavior. Such an enhanced person would not necessarily act morally, but if they wanted to they could much easily become moral (and might even "slip into" morality by their empathy and insight). But they would not have a higher moral worth or more human dignity (in the current sense) than unenhanced people." -Anders, reply to Theo N. Lyone

"Savulescu sets out an interesting case for enhancement technologies and, I think, made some interesting points about how concerns about inequality may be misleading. Others during the conference have argued that the new forms of enhancement are really continuous with old forms that have allowed people to improve themselves. So rather than worry about whether the new forms should be allowed, why not recognise that we live in a resource constrained world that we should be looking at all forms of enhancement and allocate resources to the most effective." -james.tansey on *Costs of Enhancement* in **Fairer?**

Erratum In Harvesting the Longevity Dividend in Issue 2, the percentage of US NIH funding devoted to fundamental studies of the biology of aging was inaccurately stated as 0.6%. It is actually 0.06%. For further comment on the article, see *a few corrections* in **Longer?**

Voice your opinion!

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Can We Feed the World's People?

By Stella Papadopoulou

Food availability is emerging as the one of the defining issues of the new century. But will tomorrow's people eat to live or live to eat? Scarcity of resources like land and water could threaten our ability to feed the world, according to a break-out session.

There will be more people to feed, with world population expected to rise by 50%, reaching 9 billion people by 2050. While some of us will enjoy decent living conditions, billions of others will just make ends meet living on under $2 a day. Currently, 840 million people in the world are starving and chronically undernourished.

So will it be possible to feed an additional 3 billion people and especially to manage water consumption in a sustainable way?

Clearly, it will be an enormous challenge to provide enough water for global food production, especially in those regions where water is already scarce. Agriculture is under pressure to use water resources much more efficiently. We'll have to get a lot more proactive in managing its demand for water and improving the performance of both irrigated and rain-fed production. At the same time, we need to invest in both improved technologies and better management in order to achieve more 'crop per drop'.

Another problem is the availability of land. Urbanisation is making inroads in arable farmland and will continue to do so. Uncultivated land will also have to be farmed, with the risk of further deforestation. In fact, the greatest potential for extending farmland lies in sub-Saharan Africa and Latin America.

Climate change could enormously complicate the problem of food production, through droughts, storms and desertification.

"Will tomorrow's people eat to live or live to eat?"

Finally, who will decide the food the rest of the world will eat? "Food security is more than having enough to survive," a discussant said. As globalisation has gradually taken hold, we'll have to think of food habits in the context of culture.

"People should be able to choose what they want to eat, " said Professor Albert McGill. However, for this to work, food should no longer be used as a weapon in international politics. Rather, 'secure' food supplies should be guaranteed.

Sir Crispin Tickell: The Challenges We Face

Interviewed by Mun Keat Looi

Is it foolish to discuss human enhancement when there are already problems such as climate change and population growth?

I think it important that we should start thinking about these things as part of the complex of problems that face us in the future.

A very important point is that you can't see either the medical picture or the international picture or any other picture just in isolation.

You have to see all these things together. So when we think about the problems of population increase, what is going to happen to world demographics, how climate is going to impose new strains on human society, how we are going to react to food problems, GM organisms or anything else, you have to see these problems together.

For that reason the discussion of ageing, which is happening all the time and great progress has been made in prolonging human life already, is a vital component of a big complex of issues that we should be discussing.

Of these many problems, which do you think are the biggest challenges we face today?

Again it is very difficult to distinguish one from the other, because they all come together. The biggest immediate problems are those of the impact of climate change, which has been described by the Government's Chief Scientific Adviser [Sir David King] as "a greater threat than terrorism." That will cause a lot of other problems to get worse; with refugees, food supply, problems across the whole spectrum of human activities.

The great problem we have always, in politics and in society, is seeing problems together. Very few people are good at it. We have to do our best. I think it is very valuable to have the school of the 21st century [James Martin Institute] discussing all these issues at the same time.

Are governments around the world capable of meeting these challenges?

Some governments are and some governments aren't. The Chinese government is one of the most sophisticated in the world. They understand these issues extremely well. I wouldn't like to say that all heads of government are the same, because they are not. But different degrees of sophistication, different degrees of measurement of the threat to each country are very important to consider. I often think that the big mistake industrial countries make is to impose their blueprint onto other countries. Each country has specific problems. Each has to develop a base which can consider the problems and above all each has to have politicians who are capable of taking action when the time comes to do something about it.