

SPECIAL INTEREST ARTICLES:

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THE SOUTH AUSTRALIAN BRAIN BANK

NATIONAL SCIENCE WEEK

National Science Week is well worth noting in your diaries. It is a 'celebration of science' held in August each year. It provides an opportunity to showcase Australian talent and achievements in science, engineering, technology and innovation.

A series of public events and activities are arranged as part of 'National Science Week' to interest people of all ages. Events are held in a variety of venues including museums, schools, pubs, universities, public lecture theatres, libraries and even zoos around Australia.

This type of venture provides a wonderful opportunity for people to find out more about science and become fascinated by the world in which we live. Entertainment includes astronomical viewing evenings, electronics workshops, 'Science in the Pub', concerts and much more. Presentations range from hands-on science experiments, lectures and interactive presentations to behind-the-scenes tours and spectacular science shows.

This is one of the few events in Australia that acknowledges the contributions of Australian scientists to our community. By showcasing their achievements we can see that science is 'interesting, challenging, important and relevant to our daily lives, from the wellbeing of our society to environmental sustainability'.

Science Alive is one of the many National Science Week activities. It is

held over 3 days at the Adelaide Showgrounds. It is an interactive science event that includes a 'Careers Day' for high school students on the Friday followed by a weekend of activities and demonstrations for the public. As with previous years, the South Australian Neuroscience Institute (SANI), a 'virtual institute' that unites professionals with an interest in neuroscience, will have a booth highlighting the multifarious nature of neuroscience. Scientists and students will be available to answer questions and help with the various activities on offer.

The Social Networking of Lizards is an event being held in conjunction with Flinders University and the South Australian Museum. The event will be located at the Museum, where there will be live lizards, specimens and storyboards on display for the general public and school groups. As well as this showcase, each day a scientist will present an interactive talk and a hands-on mini DNA extraction practical to demonstrate how science is changing the way we think about lizards and the importance of biodiversity.



SA BRAIN BANK FACTS & FIGURES

Current consented future donor statistics

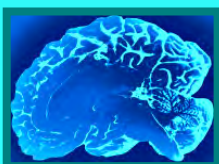
Alzheimer's disease: 14
CNS Tumour: 1
Dementia (frontal, other): 5
Epilepsy: 3
Huntington's disease: 2
Motor neuron disease: 1
Multiple sclerosis: 54
Multiple System Atrophy: 2
No neurological disease: 116
Other neurological disease: 25
Parkinson's disease: 65
Psychiatric disorder: 11

Total number of consented donors: 299

Current completed donation statistics

Alzheimer's disease: 66
CNS Tumour: 2
Diffuse Lewy body dementia: 22
Friedrich's ataxia: 2
Frontal dementia: 15
Huntington's disease: 6
Motor neuron disease: 21
Multiple sclerosis: 1
Multiple System Atrophy: 8
No neurodegenerative disease: 18
Other neurological disease: 60
Progressive Supranuclear Palsy: 9
Parkinson's disease: 29

Total number of completed donations: 259



Phineas Gage

In 1848, 25-year-old railway foreman Phineas Gage, was injured in a work accident when an iron rod was propelled through his left cheek and out through the top of his skull. Remarkably he did not lose consciousness. He was taken by ox cart to a nearby town for medical treatment. He recovered within a couple of months, having apparently just lost the sight in his left eye. While he healed physically, Gage underwent a profound change in personality. His friends said "Gage was no longer Gage". Studies of Phineas Gage's case showed that the frontal lobe was the region of the brain responsible for personality and behaviour.

Emotion Trivia

Research shows that listening to and playing music can alter how our brains, and therefore our bodies, function. The healing power of music is only just starting to be understood. For many years music has been used to reduce anxiety, stress and pain. It may also be helpful for positive change in mood and emotional states.

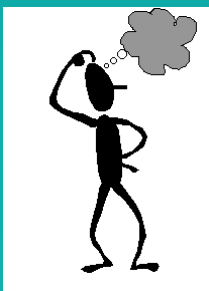


Male humpback whales are expert composers of songs. While male and female whales can produce sounds, only the male produces organized songs with distinct themes. Songs can be heard over 30kms away and may last for 20mins.

Music goes beyond the hearing and visual cortex to regions of the brain that control our emotions. By monitoring the physical reactions to music, such as changes in heart rate or sweating, researchers demonstrated that music directly elicits a range of emotions. Music with a quick tempo brings about physical changes associated with excitement. Slow tempos more often evoke serenity.

Sleep deprivation is known to impair a range of functions including immune regulation, metabolic control, learning and memory. Lack of sleep has also been shown to interfere with emotional responses.

Smells that are familiar in childhood, such as cookies baking, may trigger certain memories from the past. Memories triggered by scent have a strong emotional connection and therefore may appear to be more intense than other memory triggers.



Quotes

"Je pense, doc je suis" was French Philosopher René Descartes' famous thought on emotion ... "I think, therefore I am".

"Art is an organ of human life, transmitting man's reasonable perception into feeling". Leo Tolstoy.

"Excessive sorrow laughs. Excessive joy weeps." William Blake.

Famous Swedish film director Ingmar Bergman said of film, "no art passes our conscience in the way film does, and goes directly to our feelings, deep down into the dark rooms of our souls".

"Better to be without logic than without feeling." Charlotte Bronte.



Colours

♥ Greeks and Hebrews considered red to be a symbol of love as well as sacrifice. In Roman mythology red is associated with Mars, the God of War, after whom the 'red planet' is named.

★ In heraldry, yellow indicated honour and loyalty. More recently yellow has become a symbol of cowardice. The ancient Maya associated yellow with the direction south.

♣ The Irish associate green with luck. Emeralds are said to be a symbol of hope and the stone of prophesy.

🌊 Blue is said to symbolize piety and sincerity. Blue is associated with cleanliness. In Catholicism blue is associated with the Virgin Mary. Many of the Gods in Hinduism are depicted with blue skin.



THE EMOTIONAL BRAIN – PART 2: THE ANS

In the last newsletter we looked at the role played by the **limbic system** of the brain in the control of emotional responses. Another important region for the expression of emotions is the autonomic nervous system (ANS).

The **autonomic nervous system** is made up of nerves of whose activity we are usually unaware. Automatic responses are taking place all the time in this system to control activities such as digestion and blood circulation.

Autonomic nerve cell bodies occur outside the brain and spinal cord, located in small groups called ganglia. They send signals to the muscles and glands to ensure your body systems are maintained in a suitable state to match your activities (homeostasis).

The autonomic nervous system is composed of the sympathetic and parasympathetic nervous pathways, which often have complementary functions.

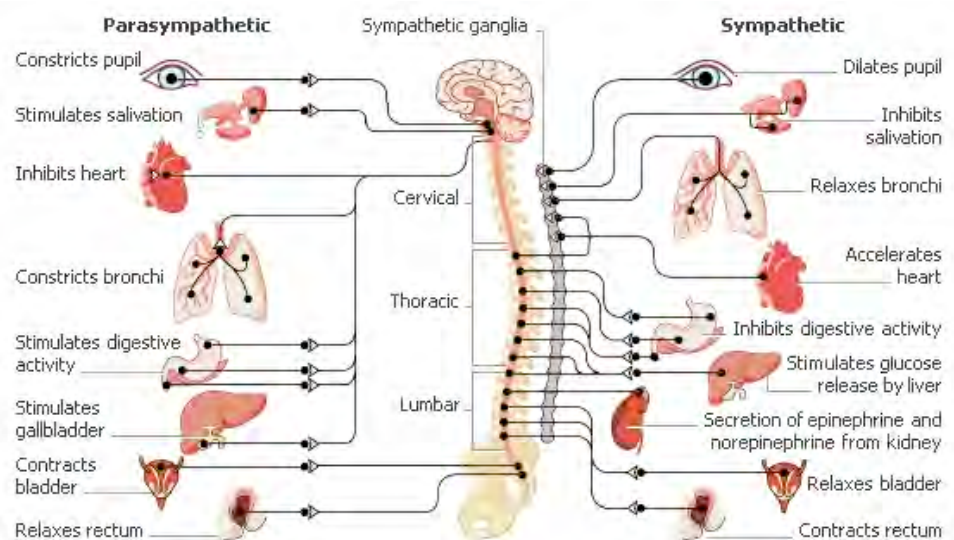
The **sympathetic nervous pathways** have diverse functions vital for life. It is essential for maintaining your normal blood pressure and body temperature. It

changes blood flow to different organs depending on what you are doing. During exercise, sympathetic pathways increase your heart rate, ensure enough blood goes to your muscles, and turn on sweating to help you lose heat. If you are frightened or stressed, some sympathetic pathways are activated to give you a “cold sweat” or pale skin, and maybe the feeling of “butterflies in your stomach”.

The second division of the autonomic nervous system is comprised of the **parasympathetic nervous pathways**. These pathways also have diverse functions, including slowing your heart after exercise, regulating the activity of the stomach during eating and digestion, secretion of saliva, control of eye focus, urination and sexual activity.

The third main part of the autonomic nervous system is the **enteric nervous system**. This is a complex of nerves within the gut that regulates the activity of the whole gastrointestinal tract. Most of this activity takes place with little if any direct involvement of the brain. In general, the brain is happy to leave these jobs to the enteric nerves!

Image: <http://www.becomehealthynow.com>



PHOBIAS

‘The word phobia (*from the Greek phóbos, meaning ‘fear’ or ‘morbid fear’*) is a term that refers to a group of symptoms brought on by feared objects or situations. It is an extreme or irrational fear and causes a person to feel intense anxiety. There are hundreds of different phobias. People develop phobias about many things and are the

most common form of anxiety disorders. Phobias can affect people of all ages. Why a person develops a particular phobia is not always clear. There may be both biological and psychological reasons. Common phobias include fear of spiders (arachnophobia), enclosed spaces (claustrophobia) and fear of flying (aviophobia).



READER'S CORNER

A Wish for You

May you get a clean bill of health from your dentist, your cardiologist, your gastroenterologist, your urologist, your proctologist, your podiatrist, your psychiatrist, your plumber and the tax office.

May your hair, your teeth, your face-lift, your abs and your stocks not fall; and may your blood pressure, your triglycerides, your cholesterol, your white blood count and your mortgage interest not rise.

May tonight find you seated around the table, with your family and friends.

May you find the food better, the environment quieter, the cost cheaper, and the pleasure more fulfilling than anything else you might ordinarily do.

May what you see in the mirror delight you, and what others see in you delight them.

May someone love you enough to forgive your faults, be blind to your blemishes, and tell the world about your virtues.

May the telemarketers wait to make their sales calls until you finish dinner, may the commercials on TV not be louder than the program you have been watching, and may your cheque book and your budget balance - and include generous amounts for charity.

May you remember to say "I love you" at least once a day to your spouse, your child, your parent, your siblings; but not to your secretary, your nurse, your masseuse, your hairdresser or your tennis instructor.

May we live in a world at peace and with the awareness of the beauty in every sunset, every flower's unfolding petals, every baby's smile, every lover's kiss, and every wonderful, astonishing, miraculous beat of our heart.

Thank you Mr Bassham for sending this in.



SERENDIPITY

Sir Isaac Newton, Mathematician and Physicist (1643-1727)

Isaac Newton was born in Lincolnshire England, 3 months after the death of his father, a prosperous farmer. His mother remarried 3 years later, leaving him to be raised by his grandmother. He was educated at The King's School, Grantham and later attended the University of Cambridge, obtaining his degree in 1665.

Newton was working on his master's degree and teaching mathematics, when the University of Cambridge was closed for a short time, as a precaution against the plague. He returned home to Lincolnshire, and while wandering in the gardens, observed an apple falling from a tree and 'the notion of gravitation came into his mind'.

This serendipitous event led Newton to consider the implications of gravity on the falling apple. He knew that gravity was the force of attraction between two objects. He determined that the large mass of the earth pulled objects toward it, explaining why the apple fell down instead of up, and why people didn't float in the air.

Newton determined that gravity could extend beyond the earth, to the moon and planets beyond. He calculated the

force needed to keep the moon moving around the earth. Then he compared it with the force that made the apple fall downward. After allowing for the distance of the moon from the earth, and it's much greater mass, he discovered that the forces were the same. He concluded that the moon was held in an orbit around the earth by the pull of the earth's gravity.

Newton formulated mathematical laws of motion and gravitation to explain the workings of the universe. No one had previously been able to explain why the planets stayed in their orbits. Newton proved that they were held in place by the sun's gravity.

Sir Isaac Newton has been credited with contributing more to the development of modern science than any other individual in history. He was knighted in 1705, not for his mathematical or scientific achievements, but for his political work. He is buried in Westminster Abbey.



Notable Quote ...

"The highest reward for man's toil is not what he gets for it, but what he becomes by it."

John Ruskin

WHAT'S NEWS?

National Science Week, 13-21 August 2011. Many events will be held around Australia. Check local papers for details or go to the National Science Week website for more information: www.scienceweek.gov.au (note that some events may be held at other times in August).

Science Alive! is a huge community event for all ages and this year will be held on **Saturday 6th** and **Sunday 7th August 2011** at the Adelaide Showgrounds in Wayville. There will be spectacular science shows, hands-on experiments, mini-planetariums, interactive exhibits, solar cars, electronics, native animals, robotics, flight simulators and so much more, including over 50 booths.

The Social Networking of Lizards (part of National Science Week) Scientists discuss how they use DNA to show that lizards have social networks like you and I. This presentation will demonstrate how science is changing the way we think about lizards and the importance of biodiversity. Venue: South Australian Museum, North Terrace, **14-21 August 2011**.

Be a part of **Australia's Unity Walk for Parkinson's in South Australia** on **Sunday September 25th 2011** at Elder Park Riverbank. For more information, contact Parkinson's SA.

PUZZLE TIME!

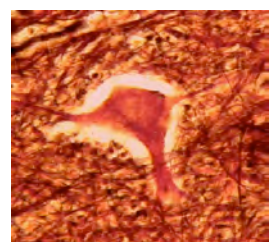
	I		P	U	N
S	R			U	O
		O	R	E	P
O				L	I
U	E	S		N	L
		R	P		
	L	N	S	O	
I		E			S
P	U		N		E

Brain Sudoko

The principles of sudoko remain the same, but instead of numbers from 1-9, this grid needs to be completed using the letters of the word **"NEUROPILS"**. Each letter is used just once in each nine square grid and just once in each line – horizontal or vertical. The solution is on the back page. Good luck.

NEUROPIL

The term "neuropil" (Gk: neuro - nerve and pilos – hair), relates to the region between nerve cell bodies in the grey matter of the brain and spinal cord. It consists of a dense network of fibres from axon terminals, dendrites and glial cell processes. It is where the synaptic connections are formed between nerve cells. The white matter, which is mostly composed of axons and glial cells, is generally not considered to be part of the neuropil.



The image on the right shows a nerve cell surrounded by neuropil.

Notable Quote ...

"Every great advance in science has issued from a new audacity of imagination"

John Dewey

**FLINDERS
UNIVERSITY**

**IMVS
CENTRE FOR
NEUROLOGICAL
DISEASES**

DISCIPLINE OF HUMAN
PHYSIOLOGY
FLINDERS UNIVERSITY
BEDFORD PARK SA 5042

TEL:
08 8204 4107

SA BRAIN BANK
MOBILE:
0431 500 880

FAX:
08 8204 5768

E-MAIL:
robyn.flook@flinders.edu.au

FOR MORE INFORMATION
ON THE SOUTH
AUSTRALIAN BRAIN
BANK, VISIT OUR
WEBSITE:

<http://www.flinders.edu.au/neuroscience/SABrainBank.htm>

FOR MORE INFORMATION
ON THE AUSTRALIAN
BRAIN BANK NETWORK,
VISIT THIS WEBSITE:

<http://www.nnf.com.au/abbn>

Your donation helps!

Tax-deductible donations can be made directly to the Flinders University - SA Brain Bank or via the FMC Foundation (**please make sure you specify that you would like your donation to go to the SA Brain Bank**). This will enable us to continue our support of research into diseases of the nervous system. Receipts for donations will be posted to you, so please include your details with any donation. Cheques should be made payable to **Flinders University – SA Brain Bank**. Contact the SA Brain Bank Coordinator, Flinders University, Human Physiology, FMC, Bedford Park SA 5042 (T: 8204 4107 or M: 0431 500 880) for more information.

Have your details changed?

If you have changed your address please let us know so we can update our records. **Contact:** SA Brain Bank Coordinator, Flinders University, Human Physiology, FMC, Bedford Park SA 5042 (or email: robyn.flook@flinders.edu.au).

Please let us know if you would like to add or remove your name from our newsletter mailing list or if you would prefer to receive it by email.

Sudoku Solution

E	I	O	L	P	S	U	R	N
S	R	P	N	E	U	O	I	L
N	U	L	O	R	I	E	P	S
O	P	S	R	U	L	I	N	E
U	E	I	S	O	N	R	L	P
L	N	R	P	I	E	S	O	U
R	L	N	E	S	O	P	U	I
I	O	E	U	L	P	N	S	R
P	S	U	I	N	R	L	E	O



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