



# The Physiological Society of Sri Lanka

## NEWSLETTER

2013

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### PSSL Council 2012/2013

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### Presidents Message

The year of 2013 celebrates the 26<sup>th</sup> anniversary of the PSSL. It has been an eventful year with academic activity. A workshop on "Innovation and Integration in Physiology Teaching" was held on the 7<sup>th</sup> June 2013 at the Microbiology seminar room of the Faculty of Medical Sciences, University of Sri Jayewardenepura. The visiting professor Prof Cheng Hwee Ming Professor of Physiology, of the University of Malaya and Dr Gominda Ponnamparuma from the MEDARC of the faculty of Medicine, University of Colombo were the resource persons.

The society held the first Inter Medical Faculty Physiology quiz for the "Professor Carlo Fonseka Challenge trophy" in June at the Faculty of Medical Sciences, University of Sri Jayewardenepura. It was a pleasure to welcome nine quiz teams from the state medical faculties participating in an atmosphere of cordiality and healthy competition. Professor Cheng Hwee Ming, was the first quiz master. He has been the main catalyst in setting up the 1<sup>st</sup> Physiology Quiz in Sri Lanka and consistently supported me and the executive committee of the PSSL in organizing this event. Prof Carlo Fonseka graced the occasion and was present to award the trophy to the winning team. The winners this year were the team from the Faculty of Medicine, University of Colombo.

Subsequent to the Sri Lanka quiz, five teams from Sri Lanka, namely, from the faculties of Colombo, Peradeniya, Kelaniya and Sri Jayewardenepura participated in the 11<sup>th</sup> Inter Medical School Physiology Quiz in Malaysia held by the University of Malaya, in August 2013. The team from the University of Sri Jayewardenepura emerged 2<sup>nd</sup> runners up after competing with over 80 teams from over 20 countries of the world.

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The PSSL held its first residential regional meeting in Jaffna and the members were hosted by the department of Physiology of the University of Jaffna. The program included an academic symposium on the second day. It was followed by a cultural tour of the Jaffna district of the historical and archeological sites. There were many interesting discussions on the history of the people, the contributions to development of medicine in Sri Lanka. It was a wonderful opportunity for the members accompanied by their families to spend some time together. Members from all faculties participated in the regional meeting and Professor K Sivapalan, Prof of Physiology at the University of Jaffna should be congratulated for all the meticulous ground arrangements. It was an opportunity to exchange ideas for the members as well as strengthen lifelong friendships.

A major outcome of the regional meeting was to conduct a multicenter study to revalidate the spirometry norms among all three ethnic groups of Sri Lanka. A round table discussion ensued thereafter and the valuable academic contributions of Prof Malini Udupihille and Prof K Sivapalan need to be acknowledged. It was encouraging to observe the keen interest by academics from all the medical faculties. A preliminary outline of the project was drafted. It will be presented at the annual academic sessions this year.

The Sri Lanka Medical association, the apex medical body in Sri Lanka, recognized the PSSL as an academic body this year. This recognition is mandatory for Sri Lanka to register the South Asian Association of Physiologists in the SAARC secretariat as a professional academic body within the SAARC. The Secretariat of the South Asian Association of Physiologists is operational in Sri Lanka and the PSSL is honored by the trust and responsibility placed by the SAAP member societies.

The annual academic sessions will be held during the 21<sup>st</sup> and 22<sup>nd</sup> of November. Academic activity will commence with a pre conference symposium on “Age related changes in nutrition, cognition, memory and balance” The annual orations, ie. K N Seneviratne oration and the A.C.E. Koch oration will be delivered by 2 eminent physiologists. I invite all to participate and enjoy the two days of academic activity on the 21<sup>st</sup> and 22<sup>nd</sup> November.

Prof. Savithri Wimalasekera  
President, PSSL



## Editorial

Human physiology or the study of function of mechanical, physical, and biochemical functions of humans, their organs, and the cells encompasses a wide range of topics, and is closely linked to almost all specialties in medicine. It is therefore necessary to widen the scope of physiology as a subject among undergraduates, postgraduates, physiologist and clinicians. The activities of the Physiological Society of Sri Lanka over the past year have extended over several areas to promote and popularize the study of physiology.

The inaugural Inter-Medical Faculty Physiology Quiz for the “Professor Carlo Fonseka Challenge Trophy” was responsible for boosting interest on physiology among medical undergraduates in all medical schools of Sri Lanka. Revalidating spirometry norms for Sri Lanka was initiated as a collaborative activity among all medical faculties island wide. The regional meeting held in Jaffna not only added to knowledge in physiology, but created awareness regarding medicine practiced in Jaffna peninsula and historical perspectives, while forming strong ties among physiologists. The abstracts of presentations at the regional meeting published in this issue show how varied topics added colour to this memorable meeting.

How day-to-day activities are linked to physiology is aptly emphasized in the article on ‘neurophysiology of visual attention’ in this issue of the newsletter, describing how among a multitude of visual stimuli, focus is directed on a selected stimulus by selectively inhibiting the processing of irrelevant information while enhancing the selected visual information.

The year’s activities will culminate in the Annual Scientific Sessions of the Physiological Society to be held this month, which will be instrumental in sharing new knowledge in physiology as well as strengthening the existing bonds among physiologists.

Dr Piyusha Atapattu  
Editor, PSSL

## “Action filled June for the PSSL !”

Dr Nalinda Silva  
Secretary, PSSL

Members of the Physiological Society of Sri Lanka (PSSL) were kept occupied in June with three events namely, Workshop on “Innovation and Integration in Physiology Teaching”, Inter Medical Faculty Physiology Quiz and the Regional Scientific Meeting held in Jaffna.

### Workshop on “Innovation and Integration in Physiology Teaching”

This workshop was held on the 7<sup>th</sup> June 2013 at the Microbiology seminar room of the Faculty of Medical Sciences, University of Sri Jayewardenepura.

#### Resource persons

Resource persons for the workshop were Professor Cheng Hwee Ming, Professor of Physiology of the University of Malaya, Kuala Lumpur, Malaysia and member of the International Union for Physiological Sciences (IUPS) and Dr. Gominda Ponnaperuma, Senior Lecturer in Medical Education, Faculty of Medicine, University of Colombo.

#### Participants

Nineteen academics from the Medical Faculties of University of Colombo, Peradeniya, Jaffna, Ruhuna, Kelaniya, Sri Jayewardenepura and the General Sir John Kothelawala Defence University (KDU Sri Lanka) participated in the workshop.

#### Specific activities

Prof. Cheng in his lecture briefed the audience on the innovative techniques that can raise the interest among students on Physiology. He emphasized the need to make Physiology learning a “fun activity” and showed a video made by students in his University to illustrate this point. Dr. Ponnaperuma gave an overview on “Integrated assessment: possibilities, pitfalls and innovations” with emphasis on application of principles on Medical Education on integration.

The participants had a group work session where they attempted to apply the knowledge gained from the presentations made by the two resource persons. Short presentations were made by each group on the outcome of the group work session. In the post lunch session presentations were made on the structure of the Physiology curriculum by academic staff members from different Faculty. Prof. Cheng who moderated this session enlightened the participants on methodologies to facilitate integration.



Figure 1. Dr. Gominda Ponnaperuma making his presentation with Professor Cheng in the audience



Figure 2 - Participants at the workshop

### Conclusion and future directions

In this workshop it was apparent that Physiology teaching has evolved considerably in the intervening years. Incorporation of novel and innovative teaching/learning activities to raise the interest among medical students on Physiology was identified as an essential component in medical curricula in Sri Lanka. The PSSL needs to be proactive in the future as well towards this end.



**Figure 3 - Prof. Vajira Weerasinghe presenting the Physiology curriculum of Peradeniya Medical Faculty**

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### Inter Medical Faculty Physiology Quiz

The Inaugural Inter-Medical Faculty Physiology Quiz organized by the Physiological Society of Sri Lanka was held on 8<sup>th</sup> June 2013 at the Faculty of Medical Sciences, University of Sri Jayewardenepura. “Professor Carlo Fonseka Challenge Trophy” was on offer to the winning team in honour of Prof. Carlo Fonseka an eminent Sri Lankan Physiologist. Prof. Carlo Fonseka, the current President of Sri Lanka Medical Council graced the occasion as the chief guest.

Professor Cheng Hwee Ming, Professor of Physiology of the University of Malaya officiated as the quiz master. Inter-Medical School Physiology Quiz (IMSPQ) held by the University of Malaya, Kuala Lumpur, Malaysia each year is the brain child of Prof Cheng. The extensive experience of Prof Cheng in organizing a similar event provided an impetus to the success of the Inaugural Physiology quiz competition in Sri Lanka.

Students from all nine Medical Faculties in Sri Lanka participated in the quiz competition representing the University of Colombo, Peradeniya, Jaffna, Ruhuna, Kelaniya, Sri Jayewardenepura and Rajarata, Eastern University and the General Sir John Kothelawala Defence University. 45 students competed while over 100 others joined in as the “cheer groups”. The latter ensured that the event remained “lively” and enjoyable one. In addition 25 academic staff members who accompanied the respective teams were among the audience. The panel of judges comprised academics from all nine Faculties and each quiz round was officiated by a judging panel of three academics.



**Figure 4 – Prof Cheng officiating as the quiz master**

The quiz was conducted in three rounds which culminated in a Grand Final where teams from Colombo, Peradeniya and Kelaniya Medical Faculties competed.

Colombo Medical Faculty emerged as the champions and claimed the Professor Carlo Fonseka Challenge Trophy while teams from Peradeniya and Kelaniya were the First and second runner-ups respectively. In addition to the trophy and certificates of participation, the winning teams received cash awards for Rs. 45,000.



Figure 5 – Audience with Prof Fonseka in the centre



Figure 6- The Final Round

### Regional Meeting of the Physiological Society of Sri Lanka - 29<sup>th</sup> June 2013

For the first time in the history of PSSSL, the Jaffna Medical Faculty hosted the Regional meeting of the Physiological Society of Sri Lanka for this year held on 29<sup>th</sup> June 2013. Prof. Sivapalan and his team had taken exceptional efforts in organizing the meeting which was a great success. The trip to Jaffna in Yal Devi was an enjoyable experience for the 38-member delegation including PSSSL members and their families.



Figure 7 - On the way to Jaffna in Yal Devi

The regional meeting was held at the board room of the Faculty of Medicine, University of Jaffna. Dr. S. Balakumar, Dean, Faculty of Medicine, University of Jaffna graced the occasion. Forty seven participants attended the regional meeting.

Out of the seven presentations of the first session, first five were research papers and the other two were concepts for contribution from various departments for better health care of the community.

There were four presentations in the second session, on Everyday Physiology, practice of medicine in Jaffna and history of Jaffna. The abstracts of the lectures are published in this issue of the newsletter. All presentations evoked much interest and aroused lively



Figure 8 – Commencement of the meeting

discussions The meeting ended at 1.30pm with lunch which provided a good opportunity for socialization.

The delegates from Colombo visited archeologically significant places and places of worship namely Nallur kovil, Nagadeepa, Jambakolapatnam / Dambakolapatuna (Mathagal), Keerimalai and Maviddapuram before they left Jaffna on Sunday the 30<sup>th</sup> June 2013 afternoon.

**Figure 9 - Prof Sivapalan leads the party into the Jaffna fort**



**Regional Meeting of the Physiological Society of Sri Lanka - 29th June 2013  
Conference Hall, Faculty of Medicine, University of Jaffna**

**Abstracts of presentations**

**Health effects of noise pollution  
Presentation on “Every day physiology” at  
the regional meeting of the Physiological  
Society of Sri Lanka**

Prof. Savithri Wimalasekera  
President, PSSL

The human ear has the ability to perceive sound from a range of about 0 dB – 140 dB. The quality of sound varies depending on the frequency and the amplitude of the sound waves. Loud music is known to cause hearing impairment known as “discotheque deafness”. There are three types of noise induced deafness. Accumulation of loud sound over a long period of time can lead to deafness. It is commonly seen among people exposed loud sound such as musical performers.

A study was conducted to assess the auditory thresholds of nathaswaram musical instrument performers working in the hindu kovils in Colombo. There were no statistically significant differences in hearing abilities between the nathaswaram players ( n = 30 ) & other instrumental players working in the same instrumental group ( p < 0.05). The hearing thresholds of the natheswaran players were

significantly lower than normal people for all the auditory frequencies tested in the same study ( p < 0.05).

Environmental noise is commonly known as all the unwanted sounds in our communities except the noise in the workplace. Noise is known to cause many adverse physiological effects. Exposure to continuous noise of over 85–90 dB, particularly over a lifetime, can lead to a progressive loss of hearing. Short-term physiological responses to noise are mediated through the autonomic nervous system and *raise the* levels of noradrenaline, adrenaline and cortisol. The rise in stress hormone levels indicates noise as a stressor, exciting short-term physiological responses.

Some of these are an increased risk of cardiovascular disease. Exposure to noise has been responsible to cause an increase in heart rate, and an increase in blood pressure, by increasing peripheral vascular resistance. A sudden intense exposure to noise may stimulate cardiac dysrhythmias.

Continued exposure to noise is associated with raised serum levels of total cholesterol, triglycerides, blood viscosity, platelet counts and glucose levels.

Noise disturbs the concentration level in performing activities, affects communication, and causes annoyance. In children, chronic exposure to noise is

known to affect cognitive function and language comprehension. Noise has a negative effect on maintaining attention, auditory discrimination and speech perception. An increased noise level is associated with poor memory, reading disability, and poorer school performance. There is also evidence that noise may increase aggression, reduce helping behavior, and reduce the processing of social cues. Noise, is known to affect the quality of sleep by altering REM sleep, and slow wave sleep patterns. In the modern world noise pollution is a growing problem that remains poorly addressed. Dangers of noise pollution need to be recognized. Measures to prevent noise pollution need to be adopted urgently

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### **Jaffna - Historical and Archaeological Perspectives**

Prof. P. Pushparatnam, Head, Department of History, University of Jaffna

Jaffna has been mentioned as "Nagadipa", "Naganadu" and "Uttaradesa" in Pali, Sinhala and Tamil literatures and literary works and inscriptions. It has a history of over 2500 years. However, the history of Jaffna before the 13th century was cloudy in the literary works. Citing the above evidences, scholars expressed that Jaffna has had a dense population after 13th century. Recent archeological studies confirm that people have lived in Jaffna continuously for over 2600 years.

The early people belonged to the Early Iron Age Culture or Megalithic Culture. In 1970's, Pennsylvania University scholars did archaeological excavations at Kantharodai in Jaffna and expressed the opinion that these people might have migrated from Tamil Nadu or might have had close ties with Early Iron Age people of Tamil Nadu. After 1970's the Department of History, University of Jaffna and the Department of Archeology have identified over 40 ancient settlements in Jaffna.

In the later part of the Early Iron Age Culture, Brahmi potsherds were a unique aspect in Tamil Nadu and Sri Lanka. The latest scientific dating of these potsherds has revealed that they belong to the period of over 500 B.C. Further, it confirms the opinion of scholars such as Dr. Sathmangala

Karunaratna, Dr. Aria Abeyasinghe and Dr. Fernando that Southern Brahmi scripts were prevalent in Sri Lanka before the introduction of Northern Brahmi script with the advent of Buddhism in Sri Lanka. In the recent times, archeological survey at Kantharodai, Anaikkodai, Chaddy and Punakary in Jaffna, potsherds with Tamil and Prakrit Brahmi letters were discovered. These evidences confirm that Tamil has been in use since about 3<sup>rd</sup> century B.C.

The geographical position of Jaffna makes it the first region which comes under the influence and impact of Tamil Nadu. Recent archeological studies reveal that Jaffna has had commercial ties with foreign countries since ancient times. Recent archeological excavations, conducted at Jaffna Fort and Kantharodai confirm the above fact. The coins, potsherds and glassware discovered during these excavations reveal that Jaffna had commercial ties with Tamil Nadu since 6<sup>th</sup> century B.C., with North India since 3<sup>rd</sup> century B.C., with Rome since 1<sup>st</sup> century B.C, with West Asia since 6<sup>th</sup> century A.D., with China from 11th to 13<sup>th</sup> century A.D. Further, the evidences reveal the close ties of Jaffna with the Kingdoms of Anuradhapura and Pollanaruwa.

The political, economic and cultural aspects of Jaffna, from the later part of 13<sup>th</sup> century A.D. to the early part of 17<sup>th</sup> century with Nallur as the capital of the Jaffna Kingdom, evolved into a region with unique cultural identity. The evidences of ruined Hindu temples discovered at Jaffna Fort confirm that the people practiced Hinduism.

Since 16<sup>th</sup> century, the 400 year European rule has made significant transformations in the centuries - old culture of Jaffna people in aspects, such as religions, languages, art and architecture, technology, education, dresses, foods and eating style, etc. As a result, the present culture of Jaffna is a mixture of traditional and European cultures.

Patriots and scholars like Anagarika Dharmapala in the South and Arumuga Navalar in the North led the movements to revive our centuries - old traditional values. As a result, Jaffna has revived its unique traditional values with great success. It is noteworthy that those who would like to trace the roots and study the Tamil culture in its pristine form prefer to visit Jaffna.

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## History of Indigenous Medicine in Jaffna

Dr.(Mrs) Sri Ranjani Sivapalan

PGDHM, M'Phil, Ph.D

Unit of Siddha Medicine, University of Jaffna

The people of Jaffna are no different to others of the pre historic period in believing that diseases were caused by evil spirits that needed offerings. Belief in the supernatural in the causation of disease was widespread until recent times. Such practices were performed by traditional physicians who sat on tortoise shaped low level seat at auspicious time to conduct the rituals by reciting Sanskrit verses before preparing and administering medicine. There is no definite information as to when occultism originated in Jaffna. The earliest reference to occult practices was by Queyroz, the Portuguese historian. He noted that both in Ceylon and India they will not begin a treatment without first consulting the soothsayer. The soothsayers solve the problem by reading from a betel leaf or the palm. The astrologer reads the horoscope to find out the influence of the planets. The indigenous practice was gradually supplanted by Siddha and Ayurveda.

Basic principles of Siddha and Ayurveda systems are similar. Way back in 600 BC, Siddha and Ayurveda emerged in South Asia as the natural way of healing. Siddha medicine was documented more than 5000 years ago. First documentation of Ayurveda is found in the Hindu *Vedas*, the world's oldest existing literature. Ayurveda became famous in North India, while Siddha system gained popularity in South India.

Portuguese (1505 - 1658) were as interested in saving souls as well as trade. The Dutchmen (1658 - 1795) were more interested in trade and less about the natives. Portuguese and Dutch, during their occupation of the island appreciated the herbal medicine and took several manuscripts to their countries. The British (1795 – 1948) exerted the most lasting influences. During this time Indigenous systems began to decline.

Towards the end of the nineteenth century, the nationalists formed a committee and made a decision to resuscitate the Indigenous system of medicine. The government appointed a Board of Indigenous Medicine in September 1928, with the Hon. Mr. K. Balasingam as chairman. The Board of Indigenous Medicine established the College of Indigenous Medicine in Siddha, Ayurveda, and Unani systems of medicine in 1929 at Borella. With the

implementation of Ayurveda act of 31 of 1961 many new and far reaching developments took place in the indigenous medical systems.

The College of Indigenous Medicine was upgraded as Institute of Indigenous Medicine and affiliated to the University of Colombo on 2nd April 1976. After the ethnic disturbances in 1983, the Siddha section was transferred to University of Jaffna on 2nd July 1984.

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## History of Allopathic Medicine in Jaffna

Prof. K. Sivapalan

Head, Department of Physiology, University of Jaffna

First batch of 5 American Missionaries with some exposure to medicine arrived in the island in 1816 at Point de Galle. After getting permission from the governor, the mission started a hospital at Tellippalai in the North. This was the first effort to introduce western medicine to the people of the country.

Dr. John Scudder, World's First Medical Missionary, opened his dispensary at Pandaitharippuin 1819. He carried out plastic reconstruction of mutilated ears, above knee amputation, excision of large tumours and even cataract operations without anesthesia, blood transfusions or antibiotics. Dr. Scudder left Jaffna for Madras in 1836 and later shifted to Vellore. Dr. Ida Scudder, Founder and Principal Emeritus of the Vellore Christian Medical College, was a granddaughter of Dr. John Scudder.

Dr. Samuel Fisk Green organized his dispensary at Manipay in 1847. He started a Medical College with 3-year course as in American Universities to increase the number of doctors. He selected students from the Batticota seminary (presently the Jaffna College). Under him, 87 completed the course and 33 more after his departure in 1873. The graduates found employment in the newer hospitals being established by the government or as General Practitioners and also in countries like India and Malaya.

During the latter part of the 19<sup>th</sup> century, Dr. James Loos who was the Colonial Surgeon for the Northern Province recommended medical education for the entire island following the model of Manipay Medical School. This laid the foundation for the establishment of the medical school in Colombo on the first of June, 1870. The government decided to stop its grant to Manipay Medical School in 1884.



This resulted in closure of the school. Dr. Benjamin A Mills stated on the demise of Dr. Green in 1884, "During Green's time, Jaffna was regarded as the headquarters of western medical science in South-East Asia".

Friend in Need Society Hospital at Jaffna was established by Ackland Dyke, the Government Agent, N.P., with the assistance of Dr. Green in 1850. This hospital has grown into what is now the Teaching Hospital, Jaffna. The medical staff of this hospital was drawn almost totally from the graduates of Dr. Green's medical school. It came under Civil Medical Department in 1907 and re-named as Jaffna Civil Hospital. Rapid development commenced after 1950. In the 1960s, it was a recognized center for postgraduate training for the Final Examinations of the Royal Colleges of England.

Dr. & Dr. Mrs. Scott arrived at Manipay hospital in 1893 and Dr. Mrs. Scott was the first lady doctor to

serve in Jaffna. She started the first nursing school at Manipay –nearly 70 years before the present nursing school in Jaffna.

Two sisters of the American Mission (Mary & Margaret Leitch) who had been in Jaffna since 1880 felt the need for a hospital for women and collected funds. The hospital was opened in 1898. Since then the hospital has essentially served as a maternity and later children hospital.

Majority of the psychiatric patients were treated by Ayurvedic physicians, spiritualists and faith-healers. From the start of the Psychiatric Unit in Point Pedro and Kankesanthurai there was a rush of patients.

The community hospitals developed at Moolaiby the people on a cooperative basis became popular in the 1950s. Another Cooperative Hospital was established in Tellippalai.

### *PSSL Events Calendar*

#### **Annual Scientific Sessions of the PSSL - 21-22 November 2013**

##### **Pre-Congress Workshop**

21 November 2013 – 0830-1300

**"Age related changes in nutrition, cognition, memory and balance"**

Faculty Board Room, Faculty of Medical Sciences, University of Sri Jayewardenepura

##### **Inauguration of the Sessions and**

**K N Seneviratne Oration 2013**

**Novel Functions of the Adipocyte Renin Angiotensin System in Obesity-Associated Inflammation and Insulin Resistance - Prof. Naima Moustaid-Moussa**

21 November 2013 – 1800 onwards - SLMA auditorium

##### **Annual Scientific Sessions – 2013**

22 November 2013 – 0800-1500 - SLMA auditorium

##### **A C E Koch Oration 2013**

**"Dual pathways for the Pulmonary C reflex" - Prof. Shripad B Deshpande**

22 November 2013 – 1600-1700 - SLMA auditorium

##### **Annual General Meeting of the PSSL - 2013**

22 November 2013 – 1500-1530

### *International Events*

**2014 - Dhaka, Bangladesh**

**4th SAAP Conference**

## The brain selects what it wants to see: Neurophysiology of visual attention

**Dr. Tharaka Dassanayake**

Senior Lecturer, Department of Physiology  
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Put yourself in the shoes (and pads!) of a cricket batsman who is in the split-second moment before hitting the ball. Your visual field (VF) is filled with different shapes, colours and movements. In a background of the stands filled with the spectators and the green outfield dotted with fielders, the dominating figure is the image of the white-clad bowler who is running towards you in his follow-through (Figure 1). All this visual information, through afferent pathways, reaches your primary visual cortex (V1) that maps a detailed neural representation of the scene in front of your retinae. From V1, visual processing continues upstream through the visual areas of the extrastriate cortex to the parietal lobe along the ‘where’ pathway (coding the location of the stimulus) and to the temporal lobe along the ‘what’ pathway (pertaining to object recognition) (Figure 3, solid arrows). However, as the



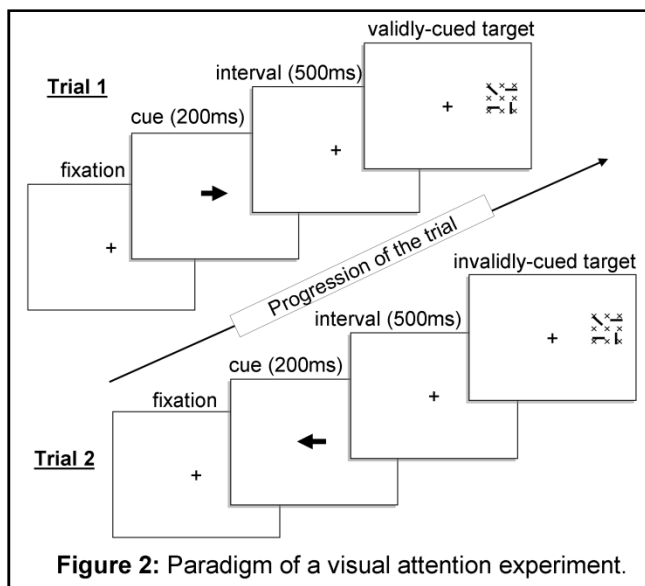
**Figure 1: Visual input of a batsman.**

batsman, you do not passively allow the visual signals to just pass through your brain. Rather, at this very moment, you actively attend to a small red circle in one corner of your VF (and thus projected into one small area of V1): the ball.

The above situation poses a simple yet philosophical question to the neurophysiologist: “If our V1 records an exact map of our VF and thus more neurones are activated by the stimuli that stand out among others (e.g. bowler), how does our

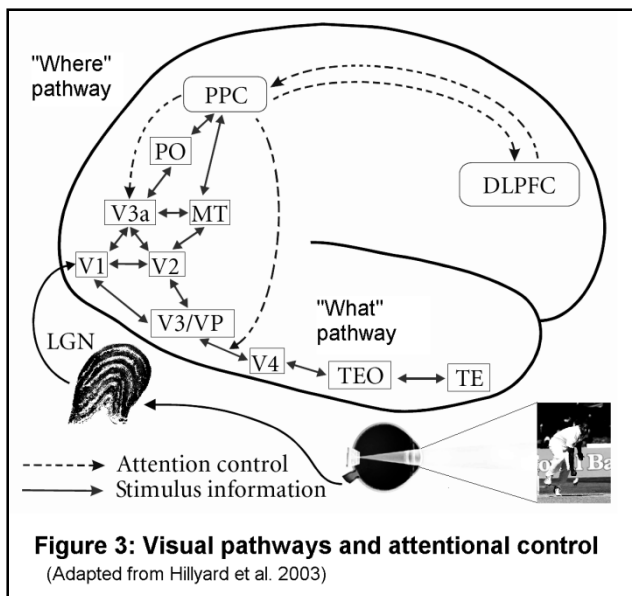
brain *selectively* attend to one rather inconspicuous stimulus (i.e. ball)?”

Cognitive processing of images is driven not only by the strength of visual stimuli, but also by the intentions of the individual. Cognitive psychologists were the first to study this interaction between vision and cognition scientifically (Posner et al., 1980). They designed intriguing experimental paradigms to examine this concept. Figure 2 illustrates one such experiment. The subject keeps his gaze fixed at the centre of the screen throughout the experiment, thus not looking at any change in the periphery of the VF. An arrow (a cue) pointing to the right (in Trial 1) or left (in Trial 2) flashes on the screen, as a cue to the possible location of a target stimulus to which the subject has to react (by pressing a button) as fast as he can. The target flashes ~500ms later, randomly on the cued location (i.e. validly cued-target) or the opposite side (i.e. invalidly-cued target). The results: validly cued targets elicit faster reaction times than invalidly cued targets, *even if the subject does not move his eyes to the cued location*. In summary, the physical characteristics of the visual stimulus to which the subject responds is the same in both validly- and invalidly-cued conditions, yet the stimulus is acted upon faster when its location is cued. In the language of cognitive psychologists, the cue is said to direct the *attentional spotlight* of our brain towards the cued location of the VF, thus facilitating the processing of stimuli that come forth in that location.



**Figure 2: Paradigm of a visual attention experiment.**

Neurophysiologists, though intrigued by this spotlight analogy of *selective attention*, were not completely satisfied. Over past three decades they went further, seeking hard-wired, brain-based mechanisms of selective attention. Using a multitude of functional neuroimaging techniques [viz. cognitive event-related potentials (ERP), magnetoencephalography (MEG) and functional magnetic resonance imaging (fMRI)] they recorded the brain activity of individuals who performed visual attention tasks like the one described above. They observed that, in addition to faster reaction times, validly-cued (compared to invalidly-cued) visual stimuli generated 1) larger ERPs in EEG recordings, 2) larger electromagnetic fields in MEG experiments and 3) greater haemodynamic responses in fMRI recordings, in visual areas in occipito-parietal pathways, indicating that the mechanism of selective attention is enhanced neural activation of target areas (Hillyard et al., 1998). Who send signals to activate these areas? Neurophysiologists also observed that this activation was *preceded* by cue-related activation of higher cortical areas in the pre-frontal and posterior parietal regions. These observations led to the deduction that neuronal pathways extending from higher cortical regions send top-down signals lower cortical regions to selectively process the task-relevant stimuli (i.e. ball, in our example) (Figure 3, dotted arrows): as if cognition comes down and modulates vision before the images are completely processed.



How early in visual processing does attention select the task-relevant information? There is robust neurophysiological evidence that attentional selections occur at the level of extrastriate cortex, 80-100ms following onset of the visual stimulus (Mangun, 1995). Some recent studies suggest that attention can modulate even the earliest stage (at 60-80ms) of cortical processing in V1, (Kelly et al., 2008). Visual attention favours early selection of the target when it is embedded in the cluttered visual background, where many visual stimuli compete for processing (Fu et al., 2009). This 'filtering' process is an important adaptation of the visual system. It relieves the visual systems from processing irrelevant information all the way up to higher cortical regions.

In conclusion, there is a satisfactory 'neurophysiological' answer to our original question (posed above in paragraph 2): the top-down neural pathways from higher cortical regions of the batsman's brain selectively enhance processing of visual impulses generated in lower cortical areas by the ball, while (according to some evidence) inhibiting the signals from the other regions of the VF. The earlier in the cortical processing you filter the task-relevant stimuli the greater will be the benefits in time-constrained tasks like batting.

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## My experience as a Young Professional Leader at the IAMP – YPL programme held in conjunction with the World Health Summit Regional Meeting in Singapore

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I was one of ten medical professionals selected to participate in the Inter-Academy Medical Panel (IAMP) Young Physician Leaders (YPLs) program, held in conjunction with the regional World Health Summit in Singapore in April 2013. This four-day program brought together 10 professionals under the age of forty years, from diverse backgrounds and fields of the medical profession.

The programme included a full day workshop held at the National University of Singapore and focused on discussing models for leadership, creation of a learning network among the YPLs to share our career experiences and challenges in our countries, problem solving and the development of an individual action plan for our own leadership development. A highlight of the workshop was a panel discussion, where we had the opportunity to meet several distinguished panellists who had served or were currently serving as leaders in their own professions.

One of the panellists was Professor Eduardo M. Krieger, Brazilian physician, physiologist and current president of the Brazilian Academy of Sciences who had been supervised by Bernardo Houssay and Eduardo Braun Menendez: Nobel Laureates for Physiology in 1947 for the discovery of angiotensin.

During a dedicated 1-hour session during the World Health Summit we were given the opportunity to present our views on the major leadership challenges we faced in our respective countries.

Of course it was not 'all work and no play'! We were introduced to the taste of Singapore's culinary delights at the Straits Kitchen, and taken on a tour of

Singapore's Gardens-by-the-Bay. We concluded the programme with a determination to continue mentorship and growth through the established YPL alumni network.

I feel that becoming a YPL has made a tremendous impact on my professional career. It has made me reflect upon myself in a positive way. I had the opportunity to liaise with nine other amazing young individuals, so similar to myself, though from very different backgrounds and who were extremely passionate about the work that they were engaged in. It was truly a once in a lifetime experience.

The IAMP-YPL programme is held annually in conjunction with the World Health Summit since 2011. It is noteworthy that every single year since its inception, a Sri Lankan professional has been selected to participate. The nominating body in Sri Lanka is the National Academy of Sciences. Any medical or non-medical professional under the age of forty years may be nominated by their institution through a member of the National Academy of Sciences.

More details are available on the IAMP-YPL website: <http://www.iamp-online.org/ypl-2013-regional-meeting-singapore>.



Figure 10 - The YPL's at the World Health Summit Regional Meeting. Dr. Amarasiri is the fifth person from the left.

### Achievements and Awards - Commonwealth Fellowship

Dr Lakmali Amarasiri, Faculty of Medicine, University of Kelaniya and Dr Dilshani Dissanayake, Faculty of Medicine, University of Colombo have been awarded the Commonwealth Fellowship this year. They are currently training in the UK