



## EAN Scientific Panel Higher Cortical Functions

### Business Meeting of the SP Higher Cortical Functions

4<sup>th</sup> Congress of the European Academy of Neurology, Lisbon

**Sunday, June 17, 2018**

**10:00-11:00 o'clock**

**CCL Lisbon, meeting room 1,13**

### Minutes

#### **1. Participants:**

The following persons entered the list: lueder@deecke.com; lperjud@gmail.com; irena.rektorova@fnusa.cz; vichy0013@yahoo.fr; egle.audronyte@yahoo.com; lauri.soinne@hus.fi; noabr@tlvmc.gov.il; masud.husain@ndcn.ox.ac.uk; evija.miglane@stradini.lv; Cornelius.weiller@uniklinik-freiburg.de; wh.heide@web.de; cann.elisa@hsr.it; haticekurucu@gmail.com; thomas.nyfeller@luks.ch; jan.laczo@seznam.cz; farzan.ashanti@gmail.com; miguel.atcp@gmail.com; fus.colvolho@gmail.com; thomas.brandt@med.uni-muenchen.de; sasa.filipovic@imi.bg.ac.rs; ipavaomartin@gmail.com; pasquale.calabrese@unibas.ch

**2. Apologies:** fastaxon@aol.ccm; armin.schnider@hcuge.ch; stefano.cappa@iusspavia.it; g.r.fink@fz-juelich.de; godefroy.olivier@chu-amiens.fr

#### **3. Welcome by the Chair**

Lüder Deecke welcomed the participants and reported that we are celebrating an anniversary:

**10 years of Higher Cortical Functions** (see attachment to these minutes).

**4. Ongoing activities:** We just had our Focused workshop (No. 10.) 'Lost in space' today, Sunday June 17, 2018 from 08:00 – 09:30 in Room Lisbon. Title: **Lost in Space – Clinical and Neurobiological Aspects of Topographagnosia.**

(patients having difficulties to find their way around ("lost in space"), read maps, draw plans and perform similar functions; often associated with damage to the right parietal or temporal lobe . . . )

Chairperson: Wolfgang Heide, Celle, DE

Presentations:

1. Masud Husain Oxford UK: *The map cannot be explored – disorders of spatial exploration in neglect (perceptive topographagnosia)*

2. Wolfgang Heide Celle DE: *The map is distorted – disorders of the perceptual analysis of space (apperceptive topographagnosia).*

3. Jan Laczo, Prague CZ: *The map is lost – disorders of spatial memory (associative topographagnosia and topographical amnesia.* The FW was well accepted. The audience filled nicely up to a full 'Room Lisbon'. Jan Lazlo was in our Business Meeting as well and wants to become a member of our SP. Very welcome!

**5. Plans for Oslo:** (5<sup>th</sup> Congress of the EAN 2019) we will apply for a Focused Workshop on Apraxia. It is all prepared, the deadline is July 15. The draft is as follows: Title of focused workshop: **Duality of Apraxias.**

First Speaker and Convenor: Prof. Georg Goldenberg (Vienna / Munich)

Title of speech: "Manipulation and communication – duality of manual function and of apraxia." **Final (7/24)**

**Duality of Function: Communication and manipulation.**

Second speaker: Prof. Cornelius Weiller (Freiburg Germany):

Arbitrary Title: "The dual loop model and apraxia." **Final (7/24) Duality of Anatomy: dorsal and ventral loop.**

Third Speaker: Prof. Angela Bartolo (Lille France).

Arbitrary Title: "Pantomime and Emblems." **Final (7/24) Duality of social function: Pantomime and gestural expression.**

### Scientific Content:

Since more than 100 years of research and clinical experience there is wide agreement that apraxia is not a unitary disorder but embraces a multitude of lesions and functional disturbances. However, most theories of apraxia also agree that the diversity of manifestations can be reduced to basic functional dualities that are correlated with anatomical dualities. A popular version of such dichotomy has been the assignment of “idea-tional” and “ideo-motor” phases of motor planning to consecutive processing in posterior and anterior brain regions. However, the validity of this posterior to anterior stream of action control has been cast into doubt by modern voxel based lesion symptom analysis in large patient samples.

Current theories of apraxia are mainly based on a distinction between dorsal and ventral processing routes separated by the Sylvian fissure. However, the elaborations of this general idea are various and partly embrace elements of the classic posterior to anterior hierarchy of motor cognition

Our workshop will present recent progress in understanding function and anatomy of apraxia with a particular emphasis on their implications for the clinical examination and ecological significances of apraxia. [7/24 2018: In the meantime Goldenberg’s Focused Workshop has been submitted to the Programme Committee. Title: Duality of Apraxias.](#)

**6. Comings & Goings:** There were elections for the management groups of the Scientific Panels. My Co-Chair from Istanbul 2014 on to this year 2018 for 4 years was **Stefano Cappa**, Pavia & Milano. Stefano will remain a member of our scientific panel, but as co-chair he left us. I wish to express my sincere thanks to Stefano. He was of great excellence in the position as Co-Chair and brought in new features such as teaching courses and other elements. I think we were a good team together, and I am going to miss Stefano. However, he is replaced by no lesser than **Masud Husain** of Oxford. I cordially welcome Masud as Co-Chair. I am looking forward to a superbe and fruitful cooperation. I am sure we are a good team as well. Furthermore I am welcoming Wolfgang Heide in our Management Group, Irena Rektorova and Noa Bregman, who were elected.

**7. Further Plans for Oslo** There has been a vivid pre-discussion about this. Miguel Pereira reminded us to offer something in cognitive Neurology for young Neurologists, and Armin Schnider made a suggestion on cognitive neurological education that has already been edited in form of a book, which is available also in English translation, and a chapter in the Handbook of Clinical Neurology. There were quite a lot of supporters of his proposal in our panel. Armin could not come to Lisbon, but he has sent his proposal to all. And I think, he can also “accommodate” Miguel Pereira’s ideas for young Neurologists. So, this should be put together. Here is part of Armin Schnider’s proposal:

“I would suggest a 2 to 3h teaching course, with 2 to 3 lectures, each taking 1 hour (45 min + 15 min questions):

1. Mental status testing by the neurologist: anatomical significance.
2. Cognitive evaluation of dementing illnesses: what the tests mean.
3. Special topic (to be discussed). Description:

Ad (1) Mental status testing by the neurologist: anatomical significance

I have made the experience that young neurologists like to understand what they examine, whether physical or cognitive/mental testing. My approach has been topographical: showing examples of disordered behaviour and explain what these deficits mean in terms of anatomy.

I have had this approach in my books:

Schnider, A. (1997/2004). *Verhaltensneurologie. Die neurologische Seite der Neuropsychologie. Eine Einführung für Ärzte und Psychologen* (2. ed.). Stuttgart: Thieme.

Schnider, A. (2008). *Neurologie du Comportement. La dimension neurologique de la neuropsychologie*. Paris: Elsevier – Masson.

[Translation: Behavioural Neurology: the neurological side of neuropsychology]

I attach a chapter, which explains part of this approach:

Schnider, A. (2008). *Neuropsychology - Bedside approaches*. In G. Goldenberg & B. L. Miller (Eds.), *Handbook of Clinical Neurology. Neuropsychology and Behavioral Neurology* (Vol. 88 (3rd series), pp. 137-154). Edinburgh: Elsevier Science.

The goal of this approach is to show to young neurologists that mental examination is not more difficult or mysterious than the physical exam. They should then learn –and develop the courage- to explore the cognitive difficulties of their patients and to understand what the results mean.

Speaker: well, I have done it many times... Also OK if somebody else feels prepared to explain these basics”

The general opinion of the discussion was that Armin should decide what he wants to do himself.

Miguel Pereira repeated what he said in Amsterdam last year. It is his plea that we should do cognitive examination for young Neurologists. In the discussion it was felt that this is covered by Armin Schnider’s proposal. Miguel Pereira wanted smaller groups. I think, however, that this might be good for teachings at Universities etc. but at congresses we want lecture rooms to be filled.

As the result of further discussions, the following title for our activities in Oslo was proposed and reads:

Practical Approach to cognitive examination in Clinical Neurology. This will be subject to further discussions. I made the suggestion, whether we should again use the term ‘Higher Cortical Functions’ instead of ‘Cognitive’ or ‘Mental’, since the Editorial Board had made this change in Amsterdam (Teaching Course 16:

“**Higher Cortical Function in Neurology – an update – Level 2**”, which I consider an honour to our panel.

There was also the suggestion that Armin Schnider should be the chair of our Oslo event. *7/24 2018: In the meantime a wonderful teaching course has been sent in to the Programme Committee by Armin, entitled: ‘Testing of Cognitive Functions by the Neurologist.’*

Irena Rektorova reported on the **Stare Splavy** EAN course in the Czech Republic. It took place this year from May 10 to 13. It will also take place in 2019. Irena suggested the following topics and speakers for the morning lectures and for the afternoon workshops:

Higher Cortical functions:

(1) Attention and Executive functions: Irena Rektorova, Brno, Czech Republic

(2) Language: Stefano Cappa, Milano, Italy

(3) Memory: Masud Husain, Oxford, UK

In the afternoon workshops, (video) cases will be presented with patients suffering from higher cortical dysfunctions, discuss how to evaluate and diagnose them and address management approaches. *Irena got a negative reply with her negotiations with Prof. Tormod Fladby, Oslo, about a hands-on workshop proposal.*

**8. Plans for Paris 2020:** Thomas Brandt made a very interesting proposal: To look at higher cortical functions from a general *thalamo*-cortical point of view. When preparing for his *Charles-Édouard Brown-Séquard Lecture in Copenhagen 2016* Title: *3-D Spatial Memory and Navigation Functions and Disorders*, he went through the literature on animal experiments in rodents on circular maze etc. By this he realized that in this literature the thalamus is very well represented. On the other hand, in the human literature, the thalamus is rather neglected. It is his opinion that this has to change. The thalamus is also for man of utmost importance.

[[This topic (Nr. 8) was still “under construction” through further communication with Thomas Brandt. There will be an addendum of topic 8 in due course.]] Now the Addendum follows:

**Addendum to topic 8 July 24, 2018:** Indeed, the thalamus is the great gate to the cortex. Nothing gets to the cortex other than via the thalamus. This is true for all senses. (except for the olfactory modality; this gets via the olfactory bulb directly to the Cortex – to the Rhinencephalon). The unique feature with the thalamus is that it is organized by means of **reverberating circuits**. When you record in the thalamus with microelectrodes and get a response, this is coming again after about 100 msec and again. This is why also the alpha rhythm of the EEG has 10 Hz on the average.  $\alpha$  is a reverberating rhythm. Reverberating circuits have the function that the respective cortical area can “ask back” if a signal or information is unclear.

E.g. the visual system, the lateral geniculate body is the thalamic relay nucleus for it. It projects to the visual cortex area 17, 18, 19. The main point is, the connection functions both ways (reverberating circuits). In case, the signal or information projected to the visual cortex is unclear for the visual cortex, it can ask back the lateral geniculate. Then the lateral geniculate sends it up again and tries to be more precise, etc. By such reverberation it becomes clearer and clearer for the cortex. The visual cortex does tremendous further processing on the information, and only when it has the result, it lets it breaching up to consciousness. And in most cases it will have found a solution, e.g. an image that makes sense. Only in the case of optical illusions, the unconscious brain says to consciousness: I tried hard on it but could not resolve this conflict: Do it yourself.

Thomas Brandt added: The particular role of the thalamus nuclei apart from just being a relay station for sensory input is its widespread connectivity to and from the cortex linking sensory, motor and cognitive areas together. Hwang and colleagues recently called the thalamus an integrative hub for functional brain networks based on specialized “provincial hubs” with many within-network connections and “connecting hubs” for

functional interactions between networks (Hwang et al. J. Neurosci 2017). It is striking that there are no interconnections between right and left thalamic nuclei. The possible benefits of such an organization are at least twofold : 1. Separate thalamo-cortical networks can achieve different complex sensorimotor and cognitive functions at the same time; 2. Structural separation allows different thalamo-cortical network structures to be established within the right and left hemispheres. They provide the basis for lateralization of brain functions (Brandt & Dieterich J. Neurol 2018).

There is still some time to Paris 2020 but a start is made here to think about a Focused Workshop on what can perhaps arbitrarily be called: The role of the thalamocortical network systems. Or, more juicy: The role of the thalamo-cortical super turntable. The Higher Cortical Functions audience is very much invited to discuss and advance this project. By the way from the audience a structure called the claustrum was thrown into the discussion. Francis Crick & Christof Koch worked on that. In summary, the thalamocortical FW project is now subject to work at. The EAN congress in Paris will be the 6<sup>th</sup> EAN Congress, taking place in Paris May 23-26, 2020.

**9. Guidelines:** At the end of June 2017 (see minutes from Amsterdam) first steps were made in 2 items: a) Aphasia (Gereon Fink, Irena Rektorova, Stefano Cappa) and b) Neglect (Masud Husain, Otto Karnath, Thedi Landis Thomas Nyffeler, Wolfgang Heide). President Deuschl had declared in Amsterdam that Guideline teams may apply for financial aid. In the meantime Co-Chair Masud Husain wrote that – as was said at the Scientific Panel Chairs' Meeting on Monday, June 18, 2018 – Guidelines have to strictly follow the current "GRADE protocol". Masud had in mind to start to work on a simpler guideline version on Neglect which would be clinically useful, whereas the GRADE protocol would be not feasible. Masud wrote an e-mail to the Chairs of the Scientific Panels to question the feasibility of the GRADE protocol and ask for their opinion. We wait until Masud gets feedback on his e-mail, and make another addendum then.

**10. Miscellaneous:** no requests

Lisbon, June 17, 2018 further worked out until June 28, 2018.

Co-Chair: Prof. Dr. Dr. h.c. Lüder Deecke Dept. Clinical Neurology Medical University Vienna Austria

Co-Chair: Prof. Dr. Masud Husain, Nuffield Dept. Clinical Neurosciences University of Oxford UK

**Prof. MUDr. Irena Rektorová, Ph.D.**