

## Chronicle

### Doctor Honoris Causa of the Adam Mickiewicz University for Professor Brian C.J. Moore



Fot. Maciej Męczyński – Życie Uniwersyteckie 2015

On November 9th, a.d. 2015, Professor Brian Cecil Joseph Moore from Cambridge University (UK), received the title of Doctor Honoris Causa of Adam Mickiewicz University from the hands of His Magnificence, the Rector of the AMU. This magnificent celebration was the great festivity for the entire Adam Mickiewicz University in Poznań, and particularly joyful for the Faculty of Physics and the Institute of Acoustics. This prestigious distinction has been awarded to Professor Moore, the most distinguished representative of the hearing sciences in Europe and unquestioned global authority in psychophysiological acoustics. Professor Brian Moore is a great scholar with a broad, in-depth knowledge and extremely wide research interests in many areas that go far beyond the mainstream of his research. He is a physicist, an acoustician and a psychologist. His main scientific achievements are related to the broadly understood neuroscience, particularly with regard to the functioning of the human auditory system. Professor Brian Moore is also a model of a scientific leader and a master; an inspiring and sympathetic guide and mentor of young scientists, the founder of his own school of hearing sciences, which brings together many generations of students and colleagues around the world. Let me therefore be allowed to bring some of his characteristics and achievements.

Brian Cecil Joseph Moore was born in 1946, in London. He studies physics and psychology at Cambridge University. He graduated in 1972 presenting a doctoral dissertation under the supervision of prof. Mark Haggard. Initially, he took a lecturer position at the University of Reading and attended a one year scientific scholarship at University of New York. Finally he moved to Cambridge in 1974, where he began his great scientific career. At the same time he became associated with the newly created Wolfson College, of which he is a fellow to this day. From the beginning of his stay in Cambridge he founded his laboratory (Hearing Laboratory) at the Department of Experimental Psychology at the University of Cambridge. This laboratory, which Professor Moore is the head of to this day, employed three permanent employees, usually accompanied by several PhD students and many visitors from abroad. Among the visitors an important place was held by both students and members of the Institute of Acoustics. At the moment, Professor Moore is an emeritus professor at Cambridge University. However, he is still professionally very active and through my direct observation I saw that due to being retired, his scientific activity earned increased. He spends more time in his laboratory and office, and takes part in numerous conferences.

The most important moments of the scientific career of Brian C.J. Moore was the appointment as a professor of auditory perception at the University of Cambridge in 1996. In 2003 he was elected as a member of The Royal Society of London (FRS). Professor Moore is also the winner of a large number of awards and distinctions. The most important of them are: The Littler Award of the British Society of Audiology (twice), the Silver Medal of the American Acoustical Society (2003), “International Award in Hearing” of the American Academy of Audiology (2004), “Award of Merit” of ENT Society (2008), Hugh Knowles Award from Northwestern University (2008), or the uttering of “Distinguished Heyser Memorial Lecture” for the International Audio Engineering Society (2010).

Professor Moore is a member of the most important societies involved in hearing and hearing loss. These are The Academy of Medical Sciences, The Acoustical Society of America, The Association for Psychological Science of the Experimental Psychology Society (UK) and the British Society of Audiology and the American Speech-Language Hearing Association. He is an honorary member of the Belgian Society of Audiology, the British Society of Hearing Aid Audiologists, and the chairperson of the Association of Independent Hearing Healthcare Professionals (UK).

Professor Moore’s research interests are the perception of sound by normal-hearing people and people with hearing impairments. Hearing is an excellent audio analyzer that allows for the identification of virtually infinite number of different sounds. The variety of sounds that are usually described with numerous sets of parameters proves the existence of many auditory perception phenomena. In his works Professor Moore touched upon almost all aspects of hearing, regardless of the complexity of the subject and of many possible issues that could be considered in the context of auditory perception. He began with a series of works on discrimination of frequency and intensity of sound. Next he dealt with an extremely important phenomenon in auditory perception, namely masking. The works on masking effect enabled him to analyze psychophysical tuning curves, the phenomenon of off-frequency listening and non-linear aspects of the hearing observed in the so-called two-tone suppression phenomenon. Professor Moore is also a co-founder of the auditory filters concept, i.e. the main model of the human auditory system. It is necessary to emphasize his great contribution to the determination of the auditory filters frequency characteristic.

In the late 80s prof. Moore has increasingly focused on hearing impairments and their perceptual consequences. Detailed analysis of the effect of loudness recruitment effect in people with sensorineural hearing loss, and in particular its impact on speech intelligibility allowed him to see the importance and the need of audio signal compression. The compression, that ad-

just the level of sounds to the residual dynamic range of the impaired auditory system is nowadays one of the most important feature of the algorithms implemented in each hearing aid. This is very important for speech intelligibility, especially when speech is presented against interfering sounds. This issue became a leading topic of his team, especially in regard to multi-channel digital hearing aids and cochlear implants. In his works, he proposed and analyzed an enormous variety of algorithms for digital hearing aids in nearly all situations, especially in the context of improving speech intelligibility presented at a background noise. In the early 90s, Professor Moore was one of the first researchers who provided a full interpretation of the Comodulation Masking Release (CMR) and Modulation Detection/Discrimination Interference (MDI) phenomena. The interpretation of these phenomena has enabled him to participate in the work on the concept of modulation filter, of which he is also a co-author.

In the 90’s Professor Moore developed the analysis and diagnostic methods of the dead regions in the cochlea of the inner ear. The dead region is the suggested name of a specific hearing loss, which was accepted in literature, and to which an increasing number of works is devoted to. Professor Moore is the author of one of the methods of dead region determination (i.e. The Threshold Equalizing Noise Method). He also played the most crucial role in the development and analysis of the so-called fast method for the psychophysical tuning curves measurement (Sweeping Noise Method) used for the dead regions frequency limits determination. At the turn of the century, Professor Moore has devoted much space in his works on the loudness model. His previous findings regarding frequency response of the auditory filters, allowed him to develop and significantly refine the loudness model, especially for time-varying sounds.

One of the newest areas of psychophysiological acoustics suggested and worked on by Professor Moore is coding frequency of sound in the auditory system based on the so-called phase locking phenomena. He questioned the frequency limit of this precise mechanism, i.e. 5 kHz, widely accepted in the literature. The work, which he published with several colleagues, including one from the Institute of Acoustics AMU, proved that many of the auditory perception phenomena can be interpreted much better by ignoring this frequency limit.

At the beginning of present century Professor Moore worked out and proposed a procedure for fitting digital hearing aids, CAM2. This procedure, based on previously developed loudness model, is an alternative to the Australian procedure NAL-NL2. Professor Moore’s method provides a complete balance of loudness in different situations, i.e. it adjusts the loudness of sounds for hearing impaired people to be the same as for normal hearing people. The loudness adjustment

is also possible in situations where speech is presented against the background of interfering signals. This puts the method with the most popular and most commonly used methods, which is undoubtedly a major achievement of the author.

The above characteristics of the scientific interests of Professor Moore is obviously not complete, as in his experimental work he touched upon almost all aspects of hearing. He is a very well recognized authority on the hearing science all over the world. He is invited, as guest of honor, to all major conferences concerned with psychophysiology of hearing. He is a reviewer and a member of scientific committees of the most important journals in the field and a member of the scientific foundations and committees supporting research of hearing.

His academic achievements include 16 books devoted to the problems of auditory perception. *An Introduction to the Psychology of Hearing* is special one, as it almost became a standard academic textbook for all those dealing with psychophysiological acoustics. It is worth mentioning, that the sixth edition of this textbook was published last year. This book has been translated into Japanese, and Polish in the late twentieth century, and its translation into Chinese is almost completed. Professor Moore is the author of nearly 120 books chapters, also published in Poland, and about 550 articles in the most prestigious scientific journals. He is the undisputed and outstanding world leader in the hearing science and his international reputation is established on the highest degree.

The excellence of this fine scientist is also proven by the people who carried out their doctoral dissertation under His supervision, and there are over 30. Today they hold the highest scientific laurels and hold very prominent positions in the academic hierarchy (Andrew Oxenham is the head of the Laboratory for Auditory Perception and Cognition, University in Minnesota, Christopher Plack who is the head of the Department of Audiology at the University of Manchester and Robert Carlyon, the head of Neuroscience Centre in Cambridge). They lead their own laboratories, whose main topic is to study the functioning of the hearing. This is a large group of alumni, which also includes those from the Institute of Acoustics, who continue to develop many ideas initiated by Professor Moore's work. It is also a proof that He created his own school of psychoacoustics and learning about hearing.

International contacts of Professor Moore and his great openness to working with centers dealing with similar research subjects are particularly noteworthy. In this context, the cooperation with Polish colleagues, mostly employees of the Institute of Acoustics of A. Mickiewicz University is the most important and most developed of all. This cooperation is continuously maintained, supported and nurtured up to this day both by Professor Moore and the staff of the Institute

of Acoustics. This fruitful collaboration, which allowed employees of the Institute of Acoustics to partake in multiple long-term stays in his laboratory, was already initiated in 1986 by prof. Urszula Jorasz. The next step of this collaboration was the first visit of Professor Moore in Poland, at the Institute of Acoustics, Adam Mickiewicz University in 1988 with a series of lectures. Thanks to his enormous commitment to the promotion, maintenance and continuous development of this collaboration, many employees of the Institute of Acoustics AMU and students of the Faculty of Physics were able to participate in long-term scholarships in his laboratory. As a part of this collaboration, Professor Moore repeatedly visited the Institute of Acoustics, and his last visit took place in 2012. Scientific scholarships of the staff and students of the Institute, often lasting many years, enabled the implementation of 12 research projects, the completion of one doctoral dissertation, publication of over 60 scientific papers co-authored by employees or students of the Institute of Acoustics AMU. These research projects also made it possible to significantly enrich the technical facilities of the Institute of Acoustics AMU and conduct specialized research in the Institute of Acoustics, AMU.

Professor Moore is a man of extremely strong personality, consistently pursuing his goals. He is extremely hard-working, extremely systematic and a pragmatic person. His office door are always open. Open to all. Many of his employees noticed that he can easily discontinue his work to discuss another topic. However, after finishing the conversation, he immediately goes back to work. He is very friendly, and especially to all those around him, past and present co-workers. I do not know that anyone has ever been refused support in both professional matters as well as those related to family life. Simply, he is a very good man.

Professor Moore is also a very talented musician. It is a pity that his playing in a jazz band and his singing in the Wolfson College choir are the things of the past. However, his guitar playing, (which he has an impressive collection in his home) constantly inspires awe and admiration. Professor Moore is also a seasoned wine connoisseur and his knowledge in this respect, sense of taste and the way in which he can talk about wine are really impressive. It is thanks to this, for many years, that he holds the position of Wine Stuart of Wolfson College.

Awarding Professor Brian C.J. Moore the highest degree of the Adam Mickiewicz University, which is the title of an Honorary Doctorate of AMU, was the crowning achievement of his illustrious career, that is extremely rich in successes and awards for his scientific work at the highest level. This is also an important chapter in the history of the Institute of Acoustics, the Faculty of Physics and the A. Mickiewicz University. Professor Moore is the main character of this great

milestone and his achievements in the field of psychophysiological acoustics. It is thanks to people like him, this narrow field of science fits permanently in the scientific mainstream of the scientific interests of the Faculty of Physics. Awarding Professor Moore by the Doctor Honoris Causa of AMU was also an expression of the highest recognition for an excellent, and very fruitful cooperation with the Institute of Acoustics. There will be no exaggeration to state that thanks to Professor Moore psychoacoustics, not only at the

Institute of Acoustics, but also in Poland, became an important branch of science. It is thanks to him a lot of members of the Institute of Acoustics began to be recognized around the world.

*Aleksander Sęk*

Institute of Acoustics, Department of Physics  
Adam Mickiewicz University  
Umultowska 85, 61-614 Poznań, Poland  
e-mail: oleksek@amu.edu.pl