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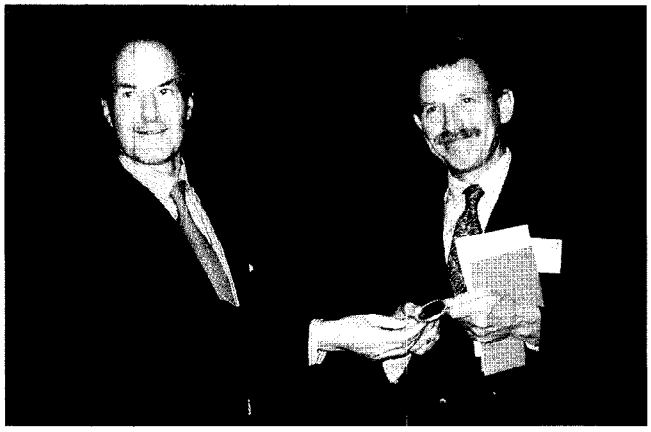
Presentation of the 1996 Ian Donald Gold Medals



Professor Juriy Wladimiroff receives the 1996 Ian Donald Gold Medal from Stuart Campbell

Tom Brown receives the 1996 Ian Donald Medal for Technical Development from Stuart Campbell

Presentation of the Ian Donald Gold Medal to Juriy Wladimiroff

This year our Society instituted new voting procedures to decide on the winner of the Ian Donald Gold Medal. It has set up a Gold Medal Committee (consisting of all previous Gold Medal winners), which is assigned the difficult task of deciding who among the crème de la crème of world ultrasound is to receive the most prestigious award of our Society.

It was no surprise to me that the first winner selected by our Gold Medal Committee was Juriy Wladimiroff, who has been in the forefront of maternal/fetal ultrasound developments over the past 25 years.

Juriy Wladimiroff is a true European, having a Russian father, a Dutch mother and an English wife. He attended Medical School in the Hague and during his training he demonstrated his interest in research by publishing several papers on Doppler tachometry in early pregnancy. It was, therefore, no surprise that, instead of joining the usual 'rat race' for promotion, he came to England immediately after he was Board Certified in 1972 to carry out ultrasound research in my department at Queen Charlotte's Hospital. I was at the time endeavoring to measure fetal urinary production rates by serial measurement of the fetal bladder. Juriy was a skilled and able assistant and, when he returned to the Netherlands as a Consultant at Erasmus University in Rotterdam, he developed this work in a series of elegant studies of fetal urinary production in different physiological and pathological situations. It was his deep understanding of fetal physiology that gave his research such depth and originality.

In 1980, he was made a full Professor at the Academic Hospital Dijkzigt and, in 1984, was made Head of the Division of Obstetrics and Prenatal Diagnosis at the Erasmus University.

From 1983, he began research in the two areas which have since dominated his research output and in which he has made such a significant contribution, namely fetal echocardiography and Doppler studies on the fetal circulation. Together with his colleague, Patricia Stewart, Juriy's work on the diagnosis of cardiac malformations became an important contribution to the literature on this subject. Perhaps even more important were his Doppler studies of the fetal circulation in which he described the first intracerebral Doppler velocimetry studies. This led to the classical work on the fetal internal carotid to umbilical artery PI ratio in the assessment of fetal well-being. Juriy Wladimiroff was one of the first researchers to stress the importance of the study of the venous circulation to assess cardiac function and, over the past few years, he has produced classic studies on the evolution of cardiac, arterial and venous vascular dynamics from the first through to the third trimester of pregnancy. As always, all of these studies have been made, not only with meticulous attention to methodology, but also to the physiological circumstances in which investigations were made. It was he more than anyone who clarified the relationship of fetal blood flow and behavioral states. Recently, Juriy has extended his clinical researches to animal experimental work on the chicken embryo in order to study the interaction between morphology and function during normal and abnormal cardiac development. His research output has, and still is, prodigious. He has published over 300 international peer-review papers and he has supervised 25 PhDs within his own department.

Juriy Wladimiroff has not only an international reputation for his research work, but has established himself in his own country and Europe as a leader in obstetrics and gynecology. He was President of the Dutch Society of Obstetrics and Gynecology between 1993 and 1995 and is Chairman of the National Liaison Committee for Medical Research Committees in the Netherlands. He is also the Netherlands Counsellor in the European College of Obstetricians and Gynecologists (ECOG).

Perhaps more importantly than these honors which come with seniority, experience and gravitas, is his reputation as an educator and trainer. He has organized a total of 12 national and eight international symposia dealing with

various aspects of fetal physiology and pathophysiology and he has organized the first postgraduate course on basic ultrasound in obstetrics and gynecology for ECOG. As Chairman of our Education Committee, he was instrumental in producing the guidelines for ultrasound training for residents in obstetrics and gynecology in the European Community.

Ladies and Gentlemen, Juriy Wladimiroff is one of the leading figures in our specialty who, by his original and meticulous research, has deepened our understanding of fetal physiology and pathophysiology and has inspired and educated a whole generation of young specialists in obstetrics and gynecology. He is a worthy recipient of the 6th Ian Donald Gold Medal.

Presentation of the Ian Donald Medal for Technical Development to Tom Brown

I have great pleasure in presenting the Ian Donald Medal for Technical Development to Tom Brown who developed the first practical ultrasound machine – namely the Compound Contact Scanner, which was used by Ian Donald to pioneer the first ultrasound diagnoses in obstetrics and gynecology.

Thomas Graham Brown was born on the 10th of April, 1933 in Glasgow. When he left school he joined the local branch of an engineering company called Kelvin Hughes Limited which had an innovative technological atmosphere redolent of the firm's founder, Lord Kelvin. In 1956, he met Ian Donald, who at that point was twice his 23 years, and began his long period of collaboration which was to lead to the development of the first direct contact compound ultrasound scanner. It is perhaps fortunate that neither Donald nor Brown were aware of the ultrasound imaging research being carried out by Douglass Howry in Denver and J. J. Wild in Minnesota. These workers were endeavoring to obtain B-mode images with water delay systems in which the subject or a part of the subject was immersed in de-gassed water. These techniques had obvious drawbacks, the most problematical being the 'reverberation' of the sound pulses in the water container. Furthermore, of course, many organs were inaccessible to the probe, especially those in the pelvis. Brown went straight to the heart of the problem – how do we obtain two-dimensional images by moving the transducer over the skin surface of the patient? The technique he invented was compound sector scanning with the probe separated from the skin surface by only a thin layer of olive oil. The transducer was mounted on a frame with linear potentiometers to measure its mean X and Y positions in the scanning plane and a sine/cosine resolving potentiometer to give a measure of the angle at which it was pointing into the patient (Figure 1). That basic arrangement never changed in all the later Diasonograph machines. Another point that was not well enough recognized was that Brown spent a great deal of effort in getting gray-scale pictures from day one. Although years later Kossoff perfected the gray-scale technique, the quality of images of early Diasonographs was due to the efforts Brown made to give some dynamic range to the displayed echoes. The Diasonograph had several versions, each one a distinct advance on its predecessor and there is little doubt that the pioneering diagnostic work of the Glasgow ultrasound school was in large part due to the quality of equipment that was available.

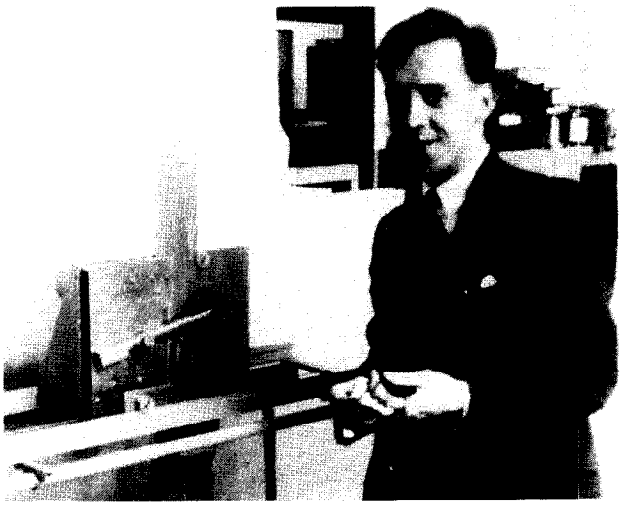


Figure 1 Tom Brown with the first prototype 'bed table' ultrasonic scanner in Glasgow, c. 1956

In 1973, Tom Brown joined Sonicaid Ltd., then makers of the widely used fetal monitoring equipment. He put together a small hand-picked team of engineers and, in tight commercial secrecy, began the development of a radically new three-dimensional stereoscopic contact compound scanner aimed at doing everything the Diasonograph did, but now in full virtual reality three-dimensions. The first instrument was unveiled at a meeting of the AIUM in San Francisco in 1976 and commercial production began later that year. Although it worked well enough as a three-dimensional machine, it was not very good at 'pretending' to be a two-dimensional slice scanner. Commercially it was a failure and the venture was abandoned in 1979. Nevertheless, it again demonstrated Tom Brown's brilliant innovative insight into the way that ultrasound had to go. It is only because of the recent huge advances in computing that Tom Brown's three-dimensional dream has now become reality.

To me, Tom Brown has a unique and important place in the development of ultrasound. Arguably, he made the most important advance of all, for the potentials of ultrasound in obstetrics and gynecology, such as dating of pregnancies, measuring fetal growth, and detecting fetal abnormalities, were all pioneered with the equipment he invented.

Ladies and Gentlemen, I have great pleasure in presenting the Ian Donald Medal for Technical Development to Tom Brown.

S. CAMPBELL