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.

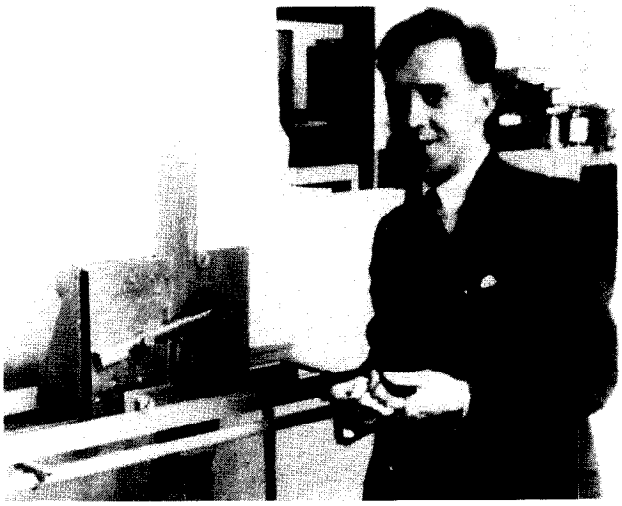

Figure 1 Tom Brown with the first prototype 'bed table' ultrasonic scanner in Glasgow, c. 1956

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