where they can learn from mentors who are experienced in research and willing to educate them’, said Al Suwaidi.

Dr Al Suwaidi is a Fellow of the American College of Cardiology (ACC), European Society of Cardiology (ESC), and Society of Coronary Interventions and Imaging, and is currently the Secretary General of the Gulf Heart Association (GHA). Away from medicine, he spends as much time with his family as possible and is a football and NBA basketball fan.

Conflict of interest: none declared.

doi:10.1093/eurheartj/ehy174

Cardiovascular Anniversaries in 2017

The present article reviews notable landmark anniversaries that occurred in 2017 which resulted in significant progress of cardiology and cardiovascular surgery

1957: Emil Sebastian Bücherl: extracorporeal circulation

John Heysham Gibbon (29 September 1903–5 February 1972), Minnesota, USA started with extracorporeal circulation on 6 May 1953 in a young patient with atrial septal defect. There were only two heart-lung machines available then, one in the Mayo Clinic, Rochester the ‘Mayo-Gibbon-Pump’ developed by John Webster Kirklin (5 April 1917–21 April 2004) and one in the University Hospital of Minnesota used by Clarence Walton Lillehei (23 October 1918–5 July 1999).

The first open heart surgery using extracorporeal circulation in Europe took place on 14 July 1954 in Stockholm, Sweden by Viking Olov Björk. Additional techniques such as hypothermia 1952 Floyd John Lewis (26 November 1916–20 September 1993), Minnesota and cross circulation 1954 Walton Lillehei were under development.

Emil Bücherl was born in Furth im Wald in Bavaria, Germany and studied in Munich, Rome, and Heidelberg 1938–44. His surgical career began in Amberg, then he changed to the Physiology Institute in Göttingen from 1948–51 with Friedrich Hermann Rein (8 February 1898–14 May 1953). He then went for a year to the Crafoord Laboratory at the Karolinska Institute in Stockholm (1951–52), working on organ perfusion and haemodynamics. Later Emil S. Bücherl moved to the Göttingen University Hospital, working together with Joseph Koncz (30 October 1916–7 November 1988) in the experimental laboratory on extracorporeal circulation. During 1957, he moved to the West End Hospital in Berlin.

The first human use of extracorporeal circulation in Germany was performed on 10 October 1957 in Göttingen in a child with tetralogy of Fallot, followed by another patient with correction of Fallot and a patient with ventricular septal defect in the same month. But the beginning of extracorporeal circulation was extremely frustrating. Unfortunately, none of the patients survived more than a few days, one died in the operating room because of sudden rupture of a tube. The international results were not significantly better: Only 1 patient of 18 survived during 1951–54 in six hospitals, all in highly experienced surgically units such as Minnesota, Detroit, and Toronto. Gradually over the years the results improved.1

In addition, Bücherl was involved in the first renal transplantation in Germany during1963, and himself performed the first lung transplant in 1968. The first left ventricular assist device was implanted in Germany by him in 1979. Emil Bücherl died on 29 June 2001.

1967: Werner Porstmann: interventional closure of Ductus arteriosus Botalli persistens

Until 1966, endovascular interventions were limited to dilatations of peripheral arterial stenoses, which was developed by Charles Dotter 1964 and the Rashkind/Miller technique for balloon septostomy in children with transposition of the great arteries, single ventricle, or total pulmonary vein drainage since 1966.

The third technique for cardiovascular interventions and the first-ever cardiovascular occlusive manoeuvre was described by Werner Porstmann (22 February 1921–5 April 1982) from the Charité Hospital in the former East Berlin, who investigated patients with patent ductus arteriosus Botalli before surgical ligation. A catheter accidentally passed through the ductus and the murmur disappeared. The team developed an ivalon plug and introduced it over a long arteriovenous wire into the ductus (Porstmann 1967).

Werner Porstmann published a series of cases in 1967.5,6 Later he developed a ‘corset’ catheter for dilatation of coronary stenoses, but the first use of this catheter – almost 3 days before Andreas Grünzig in Zürich – was stopped, because of an asymptomatic total occlusion of the formerly only stenotic left anterior descending artery, during the few days between diagnostic angiography and planned dilatation.

Porstmann was under consideration for the Nobel Prize in 1981 but died on 5 April 1982. He was posthumously honoured on...
10 September 1987 with the Andreas Grünzig Award of the European Society of Cardiology in Santiago des Compostela, for his contributions to angioplasty and closure of patent ductus arteriosus. The award was presented to his wife Annemarie.

**1967: René Gerónimo Favaloro: aortocoronary bypass surgery**

René Favaloro was born on 14 July 1923 in La Plata, Argentina, the son of Sicilian immigrants. After initial studies at the Medical School in La Plata, he worked as a vascular surgeon in the Cleveland Clinic from 1962 together with Donald Brian Effler (1915–24 August 2004) and his close friend F. Mason Sones Jr (28 October 1918–28 August 1985).


On 7 May 1967 René Favaloro implanted the first saphenous vein bypass graft to the right coronary artery.7 Then in 1968 to the left anterior descending artery also, and later he implanted multiple bypasses.8 Also, venous interponates in stenotic and occluded coronary arteries were performed from 1967. After returning to Argentina in 1970, he started with acute bypass surgery in patients with impending or ongoing infarction during the first 6 h.

Favaloro founded the ‘Fundación Favaloro’ in Buenos Aires, a hospital with scientific laboratories. During a fundamental economic crisis in Argentina the financial support of his hospital was discontinued by the government. He died on 29 July 2000. The Argentinian Cardiology Society, the award of the Society and the Heart House in Buenos Aires carry his name. The ‘Fundación Favaloro’ changed to ‘Institute of Cardiology and Cardiovascular Surgery’ and became part of the University Hospital as the Favaloro Foundation in Buenos Aires.

**1967: Christiaan Neethling Barnard: heart transplantation**

Christiaan Barnard was born on 8 November 1922 in Beauford, South Africa and trained in heart surgery at the University of Minnesota with Clarence Walton Lillehei. The technique of heart transplants was initiated experimentally in the early 1960s by Norman Edward Shumway (9 February 1922–10 February 2006).

On 3 December 1967, Barnard transplanted a donor heart from 25-year-old Denise Darvall, who died from a brain injury in a car crash, to Louis Washkansky (1913–21 December 1967), a diabetic patient following three myocardial infarctions with advanced heart failure in the Groote Schuur Hospital of the University of Cape Town, South Africa. Explantation and preparation of the donor heart was performed by Marius Barnard, the brother of Christiaan.

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The total artificial heart, first used by Denton Arthur Cooley (22 August 1929–18 November 2016) in 1969 as a bridge to transplant, and several advances in immunosuppression with cyclosporine, myco- phenolate and tacrolimus, endomyocardial biopsy for testing and immune-monitoring, resulted in a significant increase of recipient survival. Christiaan Barnard had to stop surgery because of arthritis of both hands in 1983 and died 2 September 2001 in Cyprus.

**1977: Andreas Roland Grünzig: coronary angioplasty**

Andreas Grünzig was born in Dresden 1939. His mother and her two sons (the father was missing at the end of the world war) first moved to stay with relatives in Argentina but returned to East Germany in 1951. Andreas finished school at the famous Leipzig Thomas
Gymnasium, studied in Heidelberg and started his career via St. Thomas Hospital in London in the Angiology clinic Darmstadt.

Accepting the invitation of Robert Marquard Hegglin (5 May 1907–22 November 1969) he moves as a clinical Fellow to Zurich to join the group of Alfred Bollinger (23 January 1932–3 April 2015). He changed to the Radiology department in 1971 and to the Cardiology department in 1973, which was headed by Wilhelm Rutishauser (2 September 1931). There he continued the technique of Charles Theodore Dotter (14 June 1920–15 February 1985) of endovascular vessel dilatation using rigid dilators.

On a kitchen table, he developed with Walter and Maria Schlumpf a balloon catheter on a fixed wire to dilate coronary stenoses. The foresighted cardiac surgeons A˚ke Senning (14 September 1915–21 July 2000) and Marko Turina (23 January 1937) supported his experimental and clinical work. On 16 September 1977 Grünzig diluted the world’s first coronary stenosis in a 38-year-old man with left anterior descending disease, followed by three additional patients in Zurich and two in Frankfurt headed by Martin Kaltenbach (23 September 1928). These first six patients underwent a 10-year follow-up with excellent outcomes. The Schneider Medintag company was founded in Zurich for the production of catheter balloons. Later Grünzig left Europe to continue his work in Atlanta, USA. He organized several meetings and training courses for balloon angioplasty in Zurich and later in Atlanta. Grünzig was nominated for a Nobel Prize together with F. Mason Sones Jr (28 October 1918–28 August 1985) and Melvin Paul Judkins (3 May 1922–28 January 1985) in a letter by William Thomas Foley (30 October 1911—3 October 1992) to the Medical Nobel Prize Committee on 20 October 1978. Andreas Grünzig died in a plane crash 27 October 1985.

1987: Pindaros Roy Vagelos: inhibition of cholesterol synthesis

Pindaros Roy Vagelos was born the son of Greek immigrants on 8 October 1929. He studied chemistry at the University of Pennsylvania and medicine at Columbia University and had his medical training at the Massachusetts General Hospital. He changed to the National Institute of Health in Bethesda in 1956 where he stayed for almost 10 years. There he worked as a surgeon and biochemist and started biological chemistry and training students at the University of Washington in 1966. From 1975 he was involved in the development of the first HMG-CoA reductase inhibitors, starting with compactin, discovered by Akira Endo (14 November 1933). From the Sankyo company and developed statins from Monascus rubber (lovastatin, later simvastatin) in the Merck, Sharp & Dohme company that was launched in September 1987 by the FDA. Following discussions on the patent, Merck developed simvastatin by adding a methyl group to lovastatin.

Roy Vagelos was elected president of the company in 1984. He was the CEO of Merck 1986-1994. As a member on the board of REGENERON since 1995 he focused on the development of receptor regulation which resulted in the PCSK9 inhibitor Alirocumab. In addition, he supported the World Health Organization with Ivermectin with a program to treat filariasis (river blindness, onchocerciasis) in West Africa. He also endowed his universities in Pennsylvania and Columbia. He was elected to the National Academy of Sciences and inducted into the Hall of Fame.

The authors thank for their contributions:

Dr. H. Aubin, Düsseldorf
Dr. A. Haverich, Hannover
Dr. M. Kaltenbach, Frankfurt
Dr. R. Moosdorf, Marburg
Dr. J. Thiery, Leipzig
Dr. Ch. Vallbracht, Hersfeld/Rotenburg

Conflict of interest: none declared.

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References are available as supplementary material at European Heart Journal online.