History of Canadian Anaesthesia

Daniel G. Revell (b.1904)

Among the contributions of those physicians who rose to the challenges of daily clinical experience during the first half of the 20th century, when the importance of anaesthesia was beginning to be apparent, those of Daniel G. Revell merit recognition. Revell's motivation was clinical care. An unusually innovative pioneer, he deserves attention because of his innate ability to solve problems and his persistence in implementing and refining solutions. His career is a good example of the dictum ascribed to Thomas Edison: if there is a better way of doing it, let's find it and use it.

Dan Revell was born in 1904 in Chicago, of Canadian parents. In 1907 his father moved to Edmonton, Alberta, later becoming chairman of the department of anatomy there. Dan received all his education in Edmonton, graduating in medicine in 1932. He early became skilled in wood-working, drafting, forging and machine-tooling, which he put to good use throughout his professional life and in retirement activities such as repairing and renovating antique clocks and designing artistic mobiles and windchimes.

Dan interned at the Toronto Western Hospital, where he became interested in anaesthesia. Under Dr. Charles Robson (*Can J Anaesth* 1990; 37: 579), he became the first anaesthesia resident at the Sick Children's Hospital. There his inquiring mind and inventive spirit were evident as he sought to improve and facilitate his daily work. His most ingenious device was an ether dripper. Attached by prongs to the cloth covering a Yankauer open-drop mask, and connected by tubing to an ether reservoir for either gravity- or pressure-feed, its tubing was fitted with a spigot valve, modified from a toy steam-engine, to control the drip-rate. This freed one hand for such tasks as the recording of vital signs. Revell also made a small vaporizer for ethyl chloride that facilitated the transition to maintenance with ethyl ether.

In 1934 Dan Revell married Bonnie Bailey, a graduate nurse from the Toronto Western. Together they traded the hospital environment for the more primitive one of a pioneer medical practice in the rugged mining country of northwestern Ontario. They spent the next four years

at Red Lake, making the rounds of seven mining areas on dog sled, skis, propeller-pushed skimobile or boat, depending on the season. But eventually they moved to Edmonton, where Dan limited his practice to anaesthesia. Again he designed and made equipment for his work, including a portable and relatively thermostable ether vaporizer. In 1940 he moved to the Winnipeg General Hospital as a senior staff anaesthetist, but he soon joined the Royal Canadian Army Medical Corps. While in Normandy he used an improved version of his own ether vaporizer.

After returning to Canada in 1945, Revell soon became Director of Anaesthesia at the Winnipeg Children's Hospital. There, in 1946, he became concerned about the adverse effects of apparatus dead space and resistance on his "wee patients" subjected to cyclopropane. He devised a divided "chimney" to provide inlet and outlet for the mask and a pump to circulate the gas mixture around the circle absorption system and through the mask, thereby washing out carbon dioxide and presenting "fresh" gases for each successive inspired volume. He recalls the first time this apparatus was used with an adult Heidbrink circle absorber system. The patient was a four-year-old undergoing laparotomy; he observed with satisfaction that "there was no hyperpnea." Revell provided a different answer and indeed had found a better way.

The physiological approach of the Revell divided chimney and pump excited the admiration of Ralph Waters, Digby Leigh and others of the world's best paediatric anaesthetists. The circulator concept has been of great interest to all who use the truly closed system, for which it was originally designed. Although most useful in paediatrics, it is equally beneficial for respiratory cripples of all ages, and it certainly does no harm to the healthy. Why, therefore, withhold its benefits from any anaesthetized patient?

In 1948 Dr. Revell moved to Victoria, B.C., where he continued to practice for 20 years. Now retired, he and Bonnie still live there, enjoying their home and friends. Dan remains a modest, unassuming man, with quiet humour and a wide range of interests and challenging ideas.

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