The Legacy of George S. Axelby

Our Society lost one of its dear friends and pioneers this past June. George S. Axelby died in his home after a prolonged illness. George Axelby was a graduate of the University of Connecticut and Yale and worked for Westinghouse in its Aerospace Division in Baltimore, Maryland. He was the founding editor of IEEE Transactions on Automatic Control in 1956 and the founding editor of the IFAC journal Automatica in 1968. He was a member of the first group of recipients of the IEEE Control Systems Society Distinguished Member Award in 1983, a recipient of the IFAC Outstanding Service Award, and a Fellow of the IEEE. However, this brief summary barely touches on the impact that George Axelby had on our field.

We have George Axelby’s first issue of IRE Transactions on Automatic Control, volume 1, issue 1, May 1956, in IEEE Xplore. Back then, we were part of the Institute of Radio Engineers (IRE), which merged in 1963 with the smaller American Institute of Electrical Engineers to form the current IEEE. Our Control Systems Society (CSS) was known as the Professional Group on Automatic Control (PGAC), which was formed on October 5, 1954. PGAC was formed as a means to disseminate information about automatic control, its related interests, its problems, and its developments. The charter of PGAC was to organize national group symposia and technical sessions, local professional chapters, and to publish IRE Transactions on Automatic Control. This charter has not changed much over the past 54 years.

George Axelby was a member of the administrative committee of the PGAC, corresponding to our current Board of Governors, and he was Transactions editor. In his editorial in the first issue, he wrote “Radio and electronic engineers were among those who created new theories and developed more advanced feedback circuits...and a new trend is developing—all of the complex marvels, the radar, the television, the computer, each containing internal feedback control loops, are being combined into over-all automatic control systems.” George Axelby foresaw the growth in our field, as he succinctly stated: “In the future automatic control will become more complex; it will encompass broader fields. There will be a greater need for developing and incorporating new theories, techniques, and components into integrated systems.”

George Axelby recognized the potential breadth of the field and the role of quality publications in advancing the field. He created standards for paper submission and instituted the foundations of our peer review system, forming an editorial board to evaluate contributions for possible publication. In his words, “the Transactions is the medium where this information is distributed; it is the agent where new problems and developments can be proposed.” In the early days of the Transactions, the editorial board provided the reviews of the submissions. As submissions grew, Axelby organized the editorial board as overseers of our current peer review system, trained the associate editors, and created the information dissemination committee for editorial board meetings where acceptance decisions were made. Axelby retained his position as editor through June of 1968, when he retired to the position of consulting editor.

One of the main reasons for George Axelby’s reduced involvement with the Transactions was his interest in promoting control in the international control systems community. IFAC was looking to develop an international journal focused on automatic control and was interested in converting the journal Automatica, published by Pergamon Press, into an IFAC journal. In 1968, these two organizations approached the one prominent editor in the control field, George Axelby, to become the editor of Automatica and convinced him to accept the challenge of developing another quality international publication in the control field. George Axelby soon realized that he had no editorial board or associate editors, so he set out to replicate the editorial structure of the successful IEEE Transactions on Automatic Control. He recruited a new international editorial board, one of whom was Huibert Kwakernaak, and set out to find suitable papers. He had the IFAC
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Recall, if you will, the trends of steam engine development as the nineteenth century wore on: increased flyball mass, better-engineered components and consequently reduced friction, faster engines and therefore smaller flywheel moments, striving toward astatic operation and so reduced nonuniformity. Each and all of these trends led away from stable operations. The puzzling increase in hunting behavior was now as clear as day. Simple changes could be made to turn disgruntled and wayward factory engines into well-behaved workers: don’t oil the governor, and replace the flyballs with smaller ones. In the long run better engine designs prevailed, and new governors were developed that took account of Vyshnegradskii’s words.