The development of extracorporeal circulation as a physical science was made possible through the intense efforts of individuals who were motivated by the belief that cardiopulmonary support could replace, temporarily, the body’s own circulatory and respiratory systems. It took the interdisciplinary study of physiology, chemistry, physics, engineering, and medicine to make extracorporeal circulation a reality. All focused at developing synthetic devices that could effectively, and safely, sustain patients with artificial organs, so that surgical interventions could be performed. Few fields of medicine can claim such advancement in so few years.

It is tempting to describe extracorporeal circulation as a budding science because many of the individuals credited with developmental milestones are still alive today. It has been 50 years since John Gibbon made his first heroic application of the heart-lung machine to repair an intracardiac defect. Here, in 2003, the technique that has saved the lives of so many is often vilified as a panacea of foreboding tidings. One can only wonder the power of the media in directing wrath at cardiopulmonary bypass, and identifying it as the perpetrator of negative outcome in cardiac surgery. Clearly, the science does not support such a finding. But where does that leave us?

Few advances in medicine have so affected the facilitation of surgical intervention that has been shown with the practice of cardiopulmonary bypass. Although the exact numbers are difficult to ascertain, it is known that cardiopulmonary bypass is performed over 500,000 times per year throughout the world. The imperative goal of cardiopulmonary bypass has always been to design an integrated system that could provide nutritive solutions to the body, with appropriate driving force, to maintain whole body homeostasis, while at the same time, removing toxic wastes so as not to overwhelm the body with its own pollutants. Such “perfusion” had to be conducted with minimal disruption to cellular and physiological mechanisms so that morbidity from its application is not increased. An undaunting task to say the least.

In this inaugural issue of JECT for the first half century of cardiopulmonary bypass, we highlight some of the challenges that continue to face perfusionists. The editorial by Jane Ottens from Adelaide, Australia emphasizes the importance of formal education, as the foundation upon which all advances in our discipline will occur. Papers by Howard Walton, Cyril Serrick, and Christopher Colby identify one of the cornerstones of perfusion; namely, the evaluation of new technologies. Gerald Myers and Cun Long demonstrate the application of perfusion techniques in the clinical environment, and the paper by Rebecca Knox integrates bench-top science in the pursuit of knowledge. And once again, we are heartened to see the advancement of our science through the publication of abstracts from major scientific venues.

One can only guess what John Gibbon, or any of the many pioneers in perfusion, would say when reviewing the evolution of cardiopulmonary bypass over the past 50 years. Regardless, the only thing that we know for sure is that the future of cardiopulmonary bypass rests firmly in the control of the practitioners who devote themselves to improving the conduct of extracorporeal circulation.

Sincerely,
Alfred H. Stammers, MSA, CCP
Editor