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At some point in every well-adjusted life there comes a time when an individual needs to take stock of his or her parents’ legacy. All of us must decide with which of this legacy’s aspects we will continue to define ourselves and which we will choose to respect but redefine for ourselves. How, you may ask, has this existential musing found its way into the opening editorial for the second issue of Physiology? Does this signal the author’s subconscious discomfort with his entry into mid-life or with his children’s evolving adolescence? Perhaps, I can’t be held responsible for the vagaries of my subconscious. My conscious purpose in making this observation, however, is to point out that the science of physiology has come to such a crossroads in its own evolution. Physiology as a discipline needs to figure out how to hold on to the best of the triumphs and traditions of its extraordinary history while at the same time making the scientific community at large aware of its tremendous breadth and promise for the future.

In my own rather unscientific surveys of friends and colleagues from other fields, I too often find that physiology is viewed as quaint and vaguely anachronistic—an aging uncle whose reminiscences have ceased to enthrall the younger generation at the Thanksgiving table. It is ironic that this view should prevail, especially at a time when the confluence of progress in molecular biology, genetics, biophysics, and imaging have brought physiological questions and techniques back to the forefront of biological science’s cutting edge. In fact, it is the very centrality of physiology that may have contributed to its current image problem. So many fields have now recognized the importance of physiological questions, and adopted physiology’s powerful new tools with which to answer them, that the identity of physiology and physiologists runs the risk of being overlooked or overwhelmed. It is time for the discipline of physiology to remind the scientific community not only of its proud legacy, but also of its current and pervasive influence on some of the most important research being carried out today.

It is our hope that this new journal, Physiology, will play an important role in raising this awareness. If one requires convincing evidence of physiology’s continuing preeminence, one need look no further than this month’s table of contents. Between the covers of this issue are articles whose topics encompass nearly the entire spectrum of biologically interesting levels of resolution. While Elena Babini and Michael Pusch examine the structures of single molecules in their review on prokaryotic chloride channels, Alejandro Schinder and Fred Gage explore the structures of complex cellular systems (and propose an exciting new hypothesis) in their piece on the role of neurogenesis in the hippocampus. Several articles explore the interfaces between cells, their neighbors, and their neighborhoods, extending in their scope from the biology of individual cells all the way to complex behaviors. Luis Pardo discusses the roles of potassium channels in modulation of cell proliferation, and Jonathan Franca-Koh and Peter Devreotes update us on the current understanding of the mechanisms underlying the seemingly miraculous capacity of single cells to sense and follow gradients of chemoattractants. Xavier Figueroa, Brant Isakson, and Brian Duling review the role of intercellular gap junctions in determining the capacity of blood vessels to transduce local stimuli into long-range behaviors, and Gregory Ferguson and Daniel Storm investigate the potential of calcium-stimulated adenylyl cyclases to influence the behaviors of synapses, and with them perhaps the behaviors of whole organisms. The synapse is also the subject of Grace Zhai and Hugo Bellen, who relate the generation of its unique architecture to the performance of its critical function. Alexander Gawlick and Susan Quaggin bring us up to date on the tremendous potential and potential pitfalls of applying gene-targeting techniques to create animal models that illustrate physiological functions of individual molecules and mimic the pathogenesis of human disease. Antoine Muchir and Howard Worman talk about what pathogenic mutations in components of the nuclear envelope tell us about the normal functions of this complex structure, while Brendan McMorran and Karl Kunzelmann tackle a much less arcane aspect of human pathology, whose very familiarity has obscured its fascinating physiology; they explain why your nose runs when you have a cold. In spite of, or more properly because of, their extensive span, all of these articles fit neatly and completely within the rubric of modern physiology.

Clearly, no single issue of a journal can accurately and completely reflect the current state of a discipline as multidimensional as physiology, even if that journal bears the name Physiology. We hope and expect, however, that in this and subsequent issues, Physiology will provide the scientific community with new insight into physiology’s vitality and importance. It can be argued that physiology is the science of change, and perhaps Physiology can change some perceptions about its place in the hierarchy of modern biological disciplines.