Good Fences Make Good Neighbors
Cardiovascular Science and Medicine at the End of the Millenium

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ardiovascular science and medicine have been friendly “neighbors” for decades. It was a beautiful day in the neighborhood—supportive neighborhood organizations (NHLBI) provided balanced funding of clinical and basic science projects, cardiology fellows were schooled in both clinical and scientific camps, and intimate family reunions (AHA) were designed to bring together citizens from both sides of the tracks. The “Boyz in the Hood” were Braunwald, Ross, Sobel, Willerson, Weisfeldt, Marcus, Abboud, Smith, and Haber; the icons for a generation of cardiovascular physician–scientists. It was the heyday of cardiovascular physiology, and this fundamental science was easily translated into major therapeutic advances that still form the mainstay of our current-day prognostic, diagnostic, and therapeutic approach to patients with heart disease. The experimental subject of choice was often patients themselves, and therapeutic approach to patients with heart disease. The neighborhood rap had not yet been colored by terms such as “clinical or surrogate large-animal model systems that were easily experimental, as opposed to implementation of Machiavellian strategies to keep the lights on in academic medical centers. Protected time was the norm, cardiologists were viewed as scholars versus technicians, and medicine was a profession as opposed to a business. Yes, all was well in the neighborhood of the cardiovascular system.

Unfortunately, Hurricane Georges has swept through our friendly confines. The world of academic cardiovascular medicine is now controlled by 35-year-olds in suspenders with bottom-line mentalities who are effectively creating financial walls between cardiovascular science and the practice of cardiology in academic medical centers across the United States. Firewalls are being erected to deal with the clinical, scientific, and human fallout, leading to a schism between bench and bedside. To compound the problem, the “walling out” of science from clinical cardiology has been further abetted by the inevitable progression of modern cardiovascular science from a physiological to a molecular basis, thereby elevating the inertial barrier for practicing physicians to keep pace with the latest scientific advances that will affect cardiovascular medicine. Although molecular concepts are rarely difficult to grasp, the technical jargon alone is enough to discourage the academic clinician, who now has little or no protected time. Disillusioned MD-PhD cardiologists are suffering an identity crisis, wondering whether any academic communities remain that place any value on having a foot in both worlds. In short, a number of forces beyond our control are leading to the establishment of a cardiovascular paradigm of “one system/two countries,” where cardiovascular scientists and physicians will increasingly travel in two separate academic neighborhoods. Unless governmental forces ultimately lead to the virtual reincarnation of Abraham Flexner, we will clearly have to learn to live in our divided neighborhood for many years to come. Perhaps now has a good time to listen to the wisdom of “Mending Wall.”

Good fences make good neighbors. As in the past, the future of cardiovascular medicine lies in the judicious, insightful, and careful application of fundamental scientific and technological advances into the mainstream of cardiovascular medicine. This task will require more than a knowledge of pure molecular biology. Similarly, in-depth knowledge of physiology and medicine alone may be necessary, but not sufficient. Major opportunity often lies at the interfaces between fields and requires new technology to reach the off-shore targets that have thus far been refractory to conventional strategies. In this regard, bridging technologies, such as bioengineering, hold great promise for our field. The expanding genomic database will demand a more bioinformatics-based approach to couple genes with complex physiological

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function. Science and medicine are likely to become much more quantitative in the future. The necessity of anticipating the simultaneous effects of multiple variables on a particular signaling pathway/cellular phenotype/macromolecular complex are beginning to drive molecular scientists to develop mathematical models to guide the wet-bench mechanistic dissection of the question of interest. New strategies for peptide and gene therapies for chronic cardiovascular diseases are likely to be dependent on engineering new devices, as well as new biological delivery systems. In short, if the outside financial forces dictate that it is in our best interest to create new walls, let us base the location and nature of the wall on the fundamental premise that good fences make good neighbors, and continue to work together to capitalize on the great opportunity that undoubtedly will lie at the boundary of the walls.

We should rest comfortably in the knowledge that our apple trees will not eat our neighbor’s pine cones. In fact, a bounty in one field often can predict a bounty in the other. Grateful patients with philanthropic abilities and leanings should be directed by their physicians to invest in the future, which lies in the training of the brightest young prospects with the top tier of basic scientists in the field. Cardiovascular scientists with the track record, stature, and technological strengths should aim to enlist their clinical colleagues in corporate- and NIH-sponsored translational research that is based on unique clinical and scientific strengths in the local neighborhood. Financial support from these studies should be directed toward buying protected time for the few remaining clinical scholars who have thus far survived the inclement weather.

Before we build the wall, we should carefully consider what we are walling out and walling in. The descendants of the “Boys in the Hood” should question whether it is now prudent to counsel the next generation of leaders in molecular cardiology to pursue aspirations to be a Division Chief at a time when these jobs are evolving into complex business endeavors. In a similar manner, it may be time to reconsider whether it is still appropriate to tie the bulk of an institution’s cardiovascular research resources (space, positions, startup, etc) to enticing these individuals to fill a job for which the requisite skills are neither at the bench nor the bedside, but rather in the boardroom. As an alternative, establishing Cardiovascular Institutes and providing them with these same resources may lead to “gaps even two can pass abreast” and an ability to easily traverse both fields, which is likely to be where the action will be in the new millenium. This would establish a common meeting place, a vehicle to attract private, philanthropic, and corporate funding, and a means to entice top-notch fundamental scientists to work at the boundary wall to establish the critical mass effort that will be required to translate recent scientific developments into substantive advances in human health.

Something there is that doesn’t love a wall. Although some of our patients have fur and some of them have hair, the diverse worlds of modern cardiovascular science and cutting-edge clinical medicine are inextricably intertwined. There is no government, state, or business fiat that can change the fundamental relationship and interdependency between these two fields that constitute our neighborhood. Science and medicine, practiced in their highest forms, represent a rare combination of knowledge and nobility, curiosity and craft, intellect and instinct, practicality and poetry. Now more than ever, we need to band together to ensure the future of our profession. Another poet has said it very well:

Old trees are doomed to annual rebirth,
New wood, new life, new compass, greater girth,
And this is all their wisdom and their art,
To grow, stretch, crack, and not yet come apart.

—Richard Wilbur
“Black Birch in Winter”

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