The Critical Importance or the Joy of Collaboration

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Henry Louis Mencken (1880–1956), better known as H. L. Mencken or the “Sage of Baltimore”, is quoted as saying “For every problem, there is a solution that is simple, neat, and wrong” or “For every complex problem there is an answer that is clear, simple, and wrong.” It is reasonable to put this aphorism into the context of politics and business but does it apply to science? We might think of science at its most elegant as an individual working alone developing powerful yet simple concepts or hypotheses. Some that come to mind immediately are Einstein’s $e = mc^2$ or Watson and Crick’s double helix structure for DNA. However, the reality is that demonstration of the validity of theory requires teams of researchers. This is seen with “big science” including the origin and nature of the universe, the nature of the atom, gravitational waves, and genomics.

Applied research is the province of teams of researchers. Agricultural research in universities has tended to be focused within a department specialized into a single commodity or group of commodities such as field crops in agronomy departments, fruits and vegetables in horticulture, poultry in a poultry science or a combined animal science department, dairy cattle in dairy science or a combined animal science department, pigs in an animal science department, and beef cattle in an animal science or range science department. Traditionally, the commodity departments contained scientists from different disciplines such as food science/products, genetics, microbiology, nutrition, and physiology. Researchers frequently worked in teams within a single department to address industry problems. There has been a tendency for groups of faculty to come together as disciplinary departments or graduate programs such as food science or nutrition. Today’s problems often require multi- (or inter-) disciplinary teams of researchers. Examples of today’s issues include animal environment and welfare, animal waste, and food safety. It is easy to envision the development of an interdisciplinary team to address the problems of animal waste that would include animal nutritionists (to increase nutrient absorption), agricultural engineers (to design suitable facilities for animals and their waste), microbiologists (to determine optimal microbial populations for the aerobic or anaerobic digestion of the waste), agronomists (related to soil application of animal waste), environmental scientists (related to contaminant of ground water and water sheds), agricultural economists (to evaluate the costs of different approaches to deal with the animal waste), and rural sociologists (to address societal issues). Another example is in the area of functional genomics and metabolomics, where teams include geneticists, molecular biologists, analytical chemists, bioinformaticists, statisticians, nutritionists, and physiologists.

A corollary to the changes in commodity departments and government laboratories has been the erosion in the number of faculty and other research scientists. The “joy of collaboration” may be within a department, school/college, or university. Although graduate training is most frequently focused in the discipline, a strong educational case exists for exposing students to other disciplines and most importantly to the benefits of multi- or interdisciplinary approaches. Collaboration may involve bringing together a group of researchers with similar interests from other institutions in the same country or internationally. This has many advantages ranging from intellectual stimulation and natural synergies to opening up unique funding opportunities. It can also provide graduate students with the opportunity to expand their personal, cultural, and scientific horizons. From personal experience, national and international collaborations have yielded exciting research results and long-term friendships.

We have a responsibility to science and mankind to do research in the most efficient and expeditious manner. There is a strong case for collaboration within the discipline across institutions and across international borders and cultures. Of course, the euphoria of collaboration should be tempered with accountability for the veracity of the research. Care must be taken by all concerned to ensure that there are sufficient safeguards in place. All collaborators should have sufficient information on all aspects of the project such that they can take responsibility for the contents of any resulting papers.