Most occupational therapists associate science or research with the university setting. A large percentage of the professional education programs in occupational therapy are located in institutions of higher education classified as research universities. Clearly, in occupational therapy as well as in other disciplines, a distinct relationship exists between scientific inquiry and the university setting.

The research university has played a major role in fostering science and helping it to achieve the degree of importance it currently holds in society. The traditions of this alliance are reflected in university policies as well as in public expectations about science. Moreover, changes in the nature of the relationship, brought about through economic necessity, have a potential effect on all disciplines grounded in science, including occupational therapy. For this reason, a short historical and contemporary analysis of science and research, with implications for occupational therapy, seems appropriate.

Like many other characteristics of our educational heritage, the research university was imported from Europe. European scientific thinking, which began with Aristotle and evolved with the minds of great medieval scholars like Bacon and later Copernicus, Descartes, and Newton, gradually overcame tradition, common sense, and authority as the preferred method for gaining knowledge. Aided by the adoption of the experimental method, mathematics, and instruments for extending observation beyond the naked eye, science transformed the world through discovery, thus spawning the creation of societies of scholars who in turn developed conventions for conducting and reporting their scientific activities (Boorstin, 1985).

These methods of science became known as research and, not surprisingly, the university setting became the "home" of research. To describe it thus implies both the importance that research plays in the academic environment and the role of the university in providing a setting where the scientific enterprise could develop. In fact, science and the university setting have evolved in a symbiotic way so that neither is likely to flourish without the other. A brief review of the history of the American research university and its traditions can provide an understanding of the nature of this relationship.

The German Connection

The idea of the research university was imported from Germany in the latter part of the nineteenth century. Before the Civil War, American institutions of higher education, including Harvard and Yale, were more representative of English preparatory schools than of true universities of the European variety. During that period, there were few opportunities for the advanced student to specialize in the arts and sciences without going abroad. This became more of a problem as America became industrialized and a growing number of students sought higher degrees in Europe, especially at prestigious German Universities (Brubacher & Rudy, 1976).

The appeal of these foreign universities lay in their excellence and research activities. During the nineteenth century, the German university system gained intellectual leadership through promoting original scientific research in an environment that permitted freedom of teaching and learning within carefully defined limits. Students in this system were encouraged to pursue their intellectual interests without circumscribed curricula and attendance requirements while faculty members were expected to investigate a wide range of problems within their expertise and report their findings through teaching and publications. Instructional techniques such as seminars, laboratories, and the spe...
cialized lectures were developed to assist in the training of new scholars (Brubacher & Rudy, 1976).

Although research in the nineteenth-century German university was aimed at generating new knowledge for its own sake, it also resulted in practical benefits for society. The subsequent generation of power and wealth soon helped to solidify the reputation of German universities while Bismarck was Chancellor and resulted in an unprecedented migration of American students to Germany. Graduates of the German universities returned to this country with a prestigious degree, an excellent education, and a reverence for the exactness and specialization of knowledge. The German university system, with its research, scientific specialization, and other instructional characteristics of their alma maters. Many of these graduates became presidents of influential American universities and attempted to "import" the characteristics of German universities to higher education in this country in an attempt to build authentic universities that would offer improved graduate instruction.

The Johns Hopkins Legacy

At Johns Hopkins University in Baltimore, President Daniel C. Gilman, who had experience with and respect for the German university system, founded a university that emphasized specialized graduate study presided over by a highly qualified faculty of scholars committed to scientific investigation. To this faculty was presented an outstanding group of graduate students, including John Dewey, Woodrow Wilson, and J. McKeen Cattell. These students pursued the PhD degree through a curriculum that included seminars and laboratories and emphasized the advancement of knowledge and research into the problems of daily living.

The success of the "Hopkins experiment" resulted in dramatic changes in many of the country's older liberal arts colleges which sought to reorganize themselves into full-scale universities in the Hopkins tradition. Included among these were Harvard, Yale, Columbia, and the University of Wisconsin (Brubacher & Rudy, 1976; Dropkin, Full, & Schwartz, 1975; Knoll & Kelly, 1970).

In the latter part of the nineteenth century, the University of Chicago was founded as a true research university, and its successes have contributed significantly to current educational traditions in American higher education. Its first president, William Rainey Harper, endorsed policies that stimulated research by linking faculty promotion to scholarly investigation, encouraged service by emphasizing the use of knowledge to promote the human good, and provided greater accessibility to the university through more avenues for admission and more direct channels of communication to the outside world. Other lasting innovations included the creation of a university press and the founding and sponsorship of several scholarly journals.

The Research University in the Twentieth Century

In its earliest years, research at universities was viewed as desirable because it created the type of stimulating environment that attracted and held the most capable faculty members and students. The excitement attending to the discovery of new knowledge was independent of the ability of that knowledge to produce technological improvements in the American life-style. In fact, the practical relevance of a university education was not even emphasized at the time.

But the knowledge gained from science did lead to practical purposes—both in agriculture and industry. In time, the value of university-based scientific research, not only in producing new knowledge but also in producing new scientists, became quite apparent to the public. As a consequence, there was a willingness to create new colleges and universities, which in turn required the production of new faculties. In the four decades between 1940 and 1980, the number of colleges in the country increased more than tenfold (American Council on Education, 1984).

During this time, the federal government came to regard the country's research universities as an important component of the nation's strength. The sputnik era provided dramatic evidence of this. The country's response to the threat of Soviet technological superiority was to increase support for higher education both by encouraging research and by promoting enrollment. Although the federal government had established a precedent for supporting higher education with the Morrill Act of 1862 (which led to the creation of the so-called "land grant" colleges), it was only in this century that significant federal support accrued to colleges in the form of grants-in-aid for research. Federal funding for research activities became an important part of the operating revenues of larger, doctoral-granting research universities, and it continues to play that role, albeit to a somewhat diminished extent, even today.

The University as the Home of Research

In view of the successes of the established research universities and the growing federal support for higher education, it is not surprising that most new colleges and universities have modeled themselves in the same tradition. This helps to account for the fact that research activities play a predominant role in many of today's institutions of higher education.

Although there is great diversity among universities in other areas, there has been wide agreement that the mission of a university is to create and disseminate new knowledge and to provide systematic, advanced instruction (Lynton, 1983). That research has had the more pervasive influence of the two goals is quite apparent. The production of original research and its dissemination through publication in scholarly journals is a universally valued and rewarded activity among our leading universities. Typically, decisions about promotion and tenure are strongly influenced by a faculty member's productivity in attracting grant support for research, conducting research, and publishing research reports.

Clearly, the financing, governance, and day-to-day operations of the American university are profoundly affected by research. These activities, however, are in turn gov-
The Advantages of the University as a Home for Research

Universities have evolved as centers for scientific activity because they offer an environment that both nurtures and protects faculty researchers. Scientists prefer, and are most productive in, collegial environments where they can be stimulated by other scholars (Bland & Schmitz, 1986). Because universities value and reward research productivity, they present an attractive environment to those with inquiring minds.

Additionally, because the preparation of capable scientists requires a sustained period of education and apprenticeship, the university setting offers a convenient environment for this to occur. The undergraduate curriculum provides the fundamental knowledge and skills in the liberal arts and sciences while the graduate curriculum provides the in-depth study and socialization necessary for learning the important lessons in a given scientific discipline.

The most important characteristic of the university setting, however, is its tradition of academic freedom: The search for new knowledge should not be impeded by the beliefs or value systems of others and should not carry with it the fear of reprisal if new theories or discoveries are contrary to prevailing or popular viewpoints. No scientist wishes to work in an environment where research activities and the unfettered discussion of ideas underlying them are constrained by power, authority, or existing orthodoxy.

On the other hand, the research ethos of the university has traditionally held that scientists ought not to be influenced by considerations of personal gain during the conduct of their research activities. Scientists are expected to strive for the recognition that comes from being the first to provide the answer to an important research question or propose an unsailable theory; their dedication is expected to transcend the great material rewards of success in conventional society. In truth, while the prestige of a Nobel Prize is a great incentive to most scientists, its accompanying monetary reward is seldom refused. Some have suggested that the several instances of scientific fraud which have been publicized recently may be due to a weakening of the "personal gain ethic." Such a shift in attitude can occur when scientists are enticed by the fortunes made possible through commercializing scientific discovery, particularly in the area of biomedical research (Thomas, 1983).

Technology Transfer and the University

The term technology transfer refers to the process of translating scientific knowledge into products and processes useful for society. It was noted earlier that university-based scientists have considered their traditional domain to be that of basic research, preferring, for various reasons, to leave issues of application to scientists employed by the government, business, and industry. However, higher education has been attempting to cope with a sustained period of economic austerity, and opportunities for generating revenue from closer linkages with business and industry appear enticing to university administrators and their trustees. In fact, Harvard University negotiated an agreement with a genetic engineering firm in 1982, thus bringing national attention to the issue of university involvement in technology transfer (Bok, 1982).

The issue is controversial because introducing the profit motive to campus could compromise the traditions and values of university-based research. For example, fears related to patents could impel university-based scientists to conduct their research under conditions of secrecy. This, of course, would compromise scientific progress, which is highly dependent on public disclosure and communication. More important perhaps, the introduction of a profit motive could erode the time-honored ethic of pursuing knowledge with disinterested objectivity, a practice which has furthered science while engendering public confidence and respect.

Implications for Occupational Therapy

The issues described above have important implications for occupational therapy, not only from a scientific standpoint, but also from economic, ethical, and social standpoints. To begin with, as economic pressures increase in the academic setting, occupational therapy faculty members at research universities are likely to face increased expectations to seek and obtain extramural funding for research. Additionally, productivity standards for promotion and tenure are likely to become more stringent. These factors could result in the loss of some faculty members who fail to achieve tenure and the closing of some programs demonstrating a weak performance in the area of sponsored research. These threats seem more plausible when viewed in the context of performance data on occupational therapy faculties nationally. It has been reported that, on the average, the scholarly productivity of occupational therapy faculty members falls 20% below that of their colleagues in other disciplines (Parham, 1985).

Under these circumstances, the shortage of occupational therapy faculty members who are qualified and motivated to conduct research will become more acute unless active efforts are made to identify and recruit promising young therapists to the academic ranks. Efforts to start new programs, particularly if such programs are to be located in research universities, will further aggravate the problem.

Assuming that faculty shortages can be successfully overcome, it is not too farfetched to also assume that research in occupational therapy could yield knowledge that could be commercially lucrative with respect to human performance or productivity. If this occurred, would researchers in occupational therapy be tempted to pursue only those lines of inquiry that promised material rewards? Would some be willing to falsify data or plagiarize ideas for the chance of personal gain or publicity or would they take the high ground and pursue...
compelling research questions without consideration of material reward or public acclaim?

While these questions are rhetorical for the moment, they suggest the need to revise our ethical principles for research to include matters related to intellectual ownership, the falsification of data, and commercial agreements. Ethical principles are most influential as prescriptive guides to encourage expected or desired behaviors and can serve in this function only if written in advance of violations. Accordingly, it would certainly not be too early to start working on these revisions.

A final point to consider is the manner in which the university has convinced the public that research is an important and useful activity. As knowledge gained in university laboratories has led to improvements in the American lifestyle (or life span), the public has increasingly been willing to provide support for research, both in the form of philanthropy and tax dollars. However, public support of research has also led to heightened expectations and increased accountability, both of which have important implications for the development of occupational therapy as a scientific discipline. These implications will be explored in the next essay in this series, which is entitled "Research: Its Relationship to Public Policy."

References


