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Society for Pediatric Research Presidential Address 1992: Setting Priorities for Pediatric Research—A Time for Leadership

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It seems something of a paradox that at a time of unprecedented opportunities in the science and practice of medicine there appears to be so much pessimism about our future. To be sure, we have numerous obstacles to circumvent, most of which are related to the problems of scarce, limiting resources. However, I would like to put forth the premise that the reason for much of this uneasiness and discontent is the failure to clearly establish goals and priorities and work toward their accomplishment. The academic establishment, in at least some instances, has failed to unambiguously articulate its plans and agenda in a way that is easily understood by younger faculty and trainees, who consequently receive a series of mixed and inconsistent messages that leave them confused and occasionally embittered when an already elusive target appears to be shifting in their sights. This failure to set appropriate priorities is no doubt a response to an array of very difficult decisions with which leaders are faced these days. Nonetheless, we must successfully grapple with these issues and lay our cards openly on the table. A conundrum by definition has no single proper solution. Leadership consists of making the best choices among available alternatives and then pursuing a consistent course of action.

Much has been said and written by others about the level of unhappiness, dissatisfaction, and uncertainty that currently grips the academic enterprise in general and the biochemical research establishment in particular. This issue is not entirely new. Twelve years ago, Leon Rosenberg (1) used the term the "biomedical wail" to describe a new song with the following lyrics: "Why is federal funding for biomedical research leveling off? Why doesn't the public thank us for all our marvelous work? Why aren't today's medical students stampeding to follow in our academic footsteps? Why must we spend so much time preparing grants and writing progress reports? Why must we work so hard and get paid so little?"

More recently, Leon Lederman, renowned physicist at the University of Chicago and President of the American Association for the Advancement of Science, reported to the membership of that society the results of a survey he undertook to assess the impact of constraints in federal research funding on the morale and outlook of currently active scientists (2). The resulting document, entitled *Science: The End of the Frontier?*, describes a "depth of despair and discouragement that I have not experienced in my forty years in science." After arguing passionately for the value of scientific research as *1*) the basis for new industry, *2*) the means for improving health care, *3*) the tools with which to approach the complex problems of ecology and the environment, *4*) the hope for developing alternative sources of energy and other nonrenewable resources, and *5*) the source of enormous enhancement of our culture, Lederman sees the answer to the problems of the scientific enterprise in the acute doubling of federal expenditures for all categories of research. My own view is that this sort of suggestion does not represent a workable solution given today's harsh economic realities. We are going to have to cope with the fact that biomedical research is only one of a multiplicity of societal needs. We must articulate our case clearly, forcefully, and often, but we are certain to be disappointed if we strive for goals that are unattainable. We need to be prepared to make difficult choices and, once again, to establish priorities. If we shirk these decision-making responsibilities, then others will surely assume them for us.

Frank Press, President of the National Academy of Sciences, has said, "This is a golden age of scientific discovery with great potential to improve our performance as a Nation. This is the rationale we use in our requests for increased funding. But even a country as rich as the United States cannot write a blank check for science. We need to discipline ourselves in how we request support and in how much we ask for. Otherwise we will lose our credibility" (3).

The focus of our Society and of this meeting rationalizes the case for making a more detailed assessment of the status of research in medical schools and in departments of pediatrics. We should properly put this into something of a historic context. Emile Littre commented, "If the science of Medicine is not to be lowered to the rank of a mere mechanical profession, it must preoccupy itself with its history" (4). I would argue that there are data available to help us to at least understand how we arrived at this current point in the evolution of academic pediatrics. I will try not to be judgmental in evaluating the wisdom and motivation of those who have preceded the present generation of academic leaders and to objectively describe some changes that have occurred over the last three decades.

When one looks at the fraction of total health care dollars spent on biomedical research and development, expenditures have remained relatively constant at 3.2 to 3.7% of total health spending (Fig. 1). Of course, this latter total amount has increased during the same interval from 5.3% of the gross national product to 12% of the gross national product (5, 6). The point is that research spending has grown at an equal rate. It is of note, however, that near the beginning of this era the federal government was providing the majority of the support. By 1990, industry was providing the greatest fraction of the research and development funds for health.

Specifically looking at the National Institutes of Health (NIH) budget, correcting for inflation by normalizing to 1983 constant dollars, we can see that the funding appropriated for biomedical research in all categories increased more than 5-fold during this same 30-year period (Fig. 2). In fact, NIH appropriations have been treated more generously than almost any other category of federal spending.

Where did this money go? There has been relatively little increase in inflation-adjusted funding for facilities or equipment, and only a modest increase in outlays for nonpersonnel direct costs (Fig. 3). The real increases have come in indirect costs, which have gone up 8-fold, and in salaries for principal investigators and professional personnel, which have increased by a factor of five (5).

If so much money has increasingly been allocated to biomed-

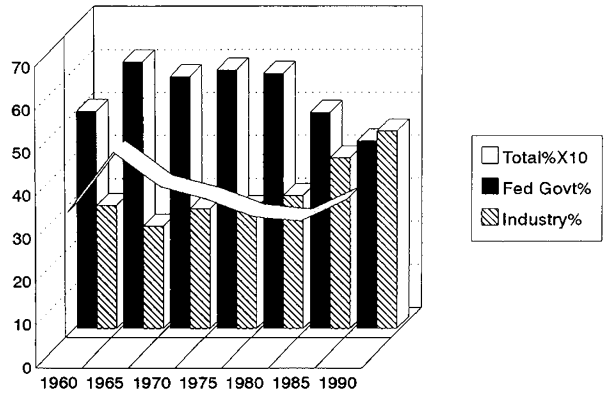

Fig. 1. National support for health research and development from 1960 to 1990. The percentage of research and development provided by the federal government and by industry is shown in the *bars*. Research and development spending as a fraction of total health care expenditures (×10) is shown by the *line*. Source of information is reference 6.

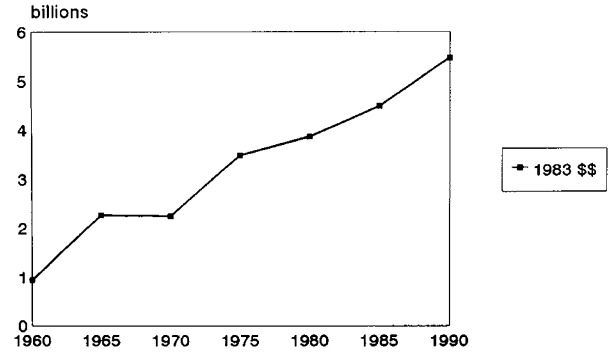

Fig. 2. Total NIH expenditures in billions of dollars (normalized to 1983 constant dollars). Data is provided from 1960 to 1990 (5, 6).

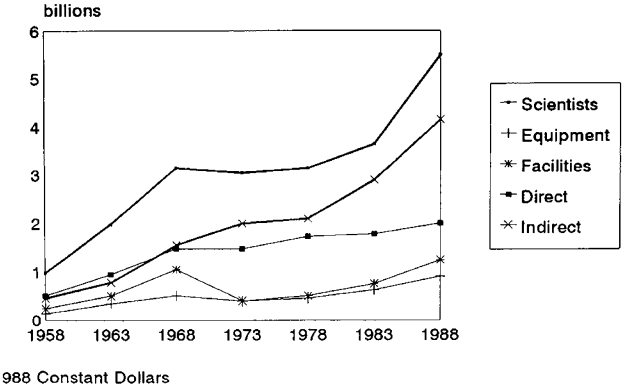

Fig. 3. Components of academic research budgets from 1958 to 1988 in 1988 constant dollars (5).

ical research, why does there seem to be such a shortage of funding? The reasons are in fact complex and relate partly to the average cost of funding the work outlined in research grants. But another factor is the population explosion that has taken place in medical school faculties. Since 1960, when the number of full-time faculty in clinical departments was 7 201, there has been an enormous increase of approximately 800% in the roster of full-time clinical faculty to a 1990 total of 59 189 (6), an average of 474 per accredited medical school (Fig. 4). Pediatrics has shared in this expansion and recent Association of American Medical Colleges data put our ranks at 6 614. These figures of course fail to include pediatricians and pediatric scientists working in other departments of medical schools, at research institutes, in industry, etc.

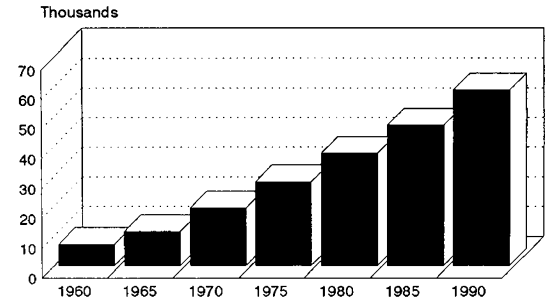

Fig. 4. Numbers of full-time faculty in clinical departments of medical schools from 1960 to 1990 (6).

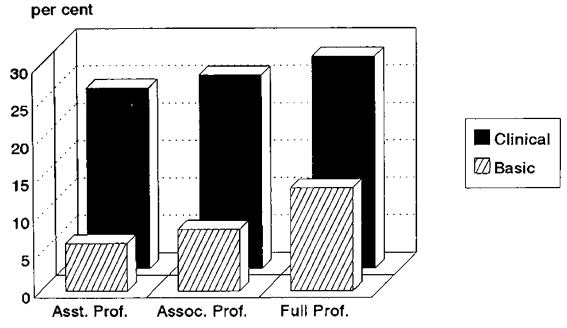

Fig. 5. Inflation-adjusted increases in clinical science and basic science faculty salaries from 1980 to 1990 (Smith B, personal communication).

Absolute numbers of academic pediatricians are only part of the story. Not only are we growing quantitatively, we are earning more money as well. I suspect that it will surprise some of you to know that we are faring reasonably well economically. Inasmuch as we are meeting in the shadows of the hallowed halls of Johns Hopkins, it is appropriate to consider some data published by DeAngelis *et al.* (7) about 2 years ago in *Pediatrics*. They found that former Harriet Lane residents who went into academic pediatrics earn as much as their colleagues in practice by the time that 10 to 15 years have gone by after completion of residency training. Indeed, those who stuck with academics for at least 20 years are earning significantly more than practitioners in their cohort. The moral of this story is clear: people who have trained at Johns Hopkins are overpaid.

What about the rest of us? Bill Smith at the Association of American Medical Colleges has recently acquired some data that he kindly shared with me (personal communication). During the past decade, salaries for full-time clinical faculty increased in constant dollars by 24% for assistant professors, 26% for associate professors, and 28% for full professors, substantially more than for their basic science colleagues (Fig. 5).

Although surgeons made truly astounding gains during the past decade, pediatricians and internists did not fair too badly, with comparable 15 to 19% increases at all academic ranks after correcting for inflation (Fig. 6). During the same interval, according to data culled from *Medical Economics* (8), pediatric practitioners earned essentially no more at the end of the decade than they did at its beginning. In fact, some academic subspecialists have fared better economically than almost anyone, save junk bond salesmen and professional athletes.

As the currently fashionable saying goes, one doesn't have to be a rocket scientist to calculated the consequence of this growth in numbers of faculty in clinical departments and in their salaries. In the decade of the 80s, the size of departments increased by 56% and average compensation grew by 26% in inflation-adjusted dollars. Therefore, in real terms, the payroll of the average medical school clinical department doubled during this time.

It has often been recounted how the early growth in medical school faculty size was fueled by generous federal research fund-

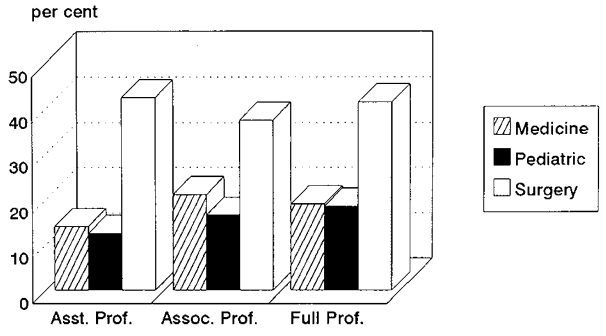

Fig. 6. Inflation-adjusted salary increases in departments of medicine, pediatrics, and surgery from 1980 to 1990 (Smith B, personal communication). During this same interval, pediatric practitioner earnings increased by only 0.8% according to calculations made from published data (8).

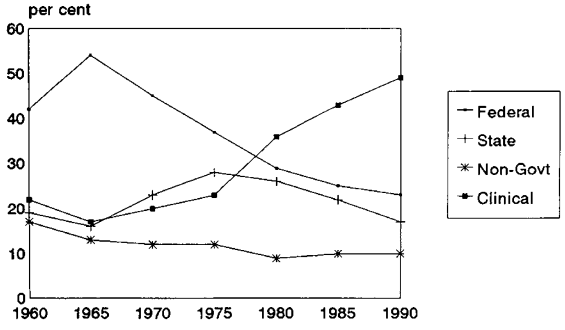

Fig. 7. Relative sources of support for U.S. medical schools from 1960 to 1990 (6).

ing for salaries and facilities. In the 1970s, a shift in emphasis occurred with the development of large clinical practices, which now provide 49% of the operating revenues of medical schools, while federal support has fallen (6) from a peak of 54% to the current level of only 23% (Fig. 7). A cycle ensued in which more clinically active faculties grew in numbers and earning power. Third-party payers rather than the NIH became the principal source of funds. In my opinion, a critical balance has been exceeded. It is no longer possible to sustain the numbers of current faculty at their present levels of compensation by relying on research-derived dollars as the main source of economic sustenance. We have outgrown our blood supply. We have seen our departments grow so large and the salaries of at least some subspecialists go so high that we cannot contemplate in the foreseeable future a return to the days when grant-derived revenues supported entire departments. Moreover, the substantial growth in faculty salaries, which has often been distributed very unevenly, has entirely changed the culture and the value systems of our departments. The way we do business has changed forever.

Some years ago, Lewis Thomas (9) published a popular collection of essays on more unusual aspects of biology that took its title from the first chapter, called "The Medusa and the Snail." I have always been fascinated by the curious story of the unusual symbiotic relationship between these two animals. In the Bay of Naples and in the deep waters of the North Atlantic there lives a nudibranch, a slug-like creature called *Phylliroe bucephala* with a most unusual life cycle. As an adult it has a very tiny, vestigial jellyfish attached to its ventral surface, close to its mouth. Both the nudibranch and the jellyfish, properly called *Zanclea costata*, are capable of reproduction at the proper time of year. The jellyfish spawns first and gives rise to offspring that are much larger. Later, the much smaller phylliroe larvae are engulfed by the medusa and are ingested. However, once inside the jellyfish, the snail begins to nibble away at the jellyfish while it grows to adulthood, eating the medusa from the inside out until it is reduced in size to the original parasitic remnant. Could it be that clinical services in our departments are like the phylliroe larva, having been originally embraced in the mistaken belief that they would provide nourishment and ask nothing in return? Only later will we discover the true nature of their insidious and voracious appetites. Will they munch away at the more academic side of our enterprises until relatively little is left?

There may be those who recall prior days of glory and wistfully long for their return. However, one of the great sorrows of life is that nothing stays the same. Moreover, I would suggest that the gentle patina of the years has obscured for some a clear view of the realities of times gone by. They were not always that great. We must admit that some time ago we lost our innocence. Pediatric departments are no longer small, intimate, or even necessarily collegial entities. They are highly evolved, socially complex, and very pluralistic organisms. We shouldn't be fighting this fact; rather, we should be taking advantage of it. To return to our basic theme, however, we must start establishing priorities. I will share with you some of mine. I feel we need to set limits as to how large the resource base we have really permits us to grow. We need to constrain the size of departments to reasonable dimensions. In areas of normal medical service density, it is not necessary or appropriate that we provide total care for all of the children in our region. The apparent financial gains are often illusory or at best transient. I doubt that any one of us is wise enough to predict with certainty the way in which physicians services will be reimbursed in another decade. If we allow our academic programs to be subjugated to fiscal needs, we will lose precisely that aspect of our activities that makes us unique and distinguishes us from our nonacademic competitors. Let us take advantage of our size and newfound financial muscle to ease the way for new fellows and faculty members by helping some of them deal with their staggering burden of loans through creative programs of debt retirement. Let us make some of the difficult decisions to engage in responsible academic birth control by only training fellows in areas in which there is genuine need and where the quality of the training experience is truly outstanding. The size of fellowship programs should be based on the research opportunities available and not on clinical service needs. Trainees must be provided with the best possible investigative opportunities basic to their discipline. We must be unselfish and recognize that the best research training environment may not exist within a department of pediatrics. It is far better to train a few people very well in a way that will sustain them through an entire academic career than to train large numbers of fellows in a less satisfactory way. We need to put in place mechanisms to give real and meaningful rewards to our best teachers and clinicians. Although much lip service has been given to this point, little progress that I am aware of has really been made. Honest, objective criteria for evaluation must be developed, and we must agree among ourselves what it is that we really want from members of our faculty who focus their activities at the bedside.

Finally, in the area of research, we must temper our expectations with reality and recognize that the nation cannot provide ever and ever greater funding with so many other needs. Each department should identify a few areas of excellence and focus their efforts in an attempt to be competitive, unless they truly have the physical, fiscal, and human resources to cover the waterfront.

These are my priorities. I recognize full well that others might end up with a somewhat different list. It matters not. What is important is the *process* of evaluating choices and the recognition that you cannot have it all. If the pediatric community fails to respond to these realities, then I fear that others far less knowledgeable will be making these choices for us.

It has been my privilege to be President of the Society for Pediatric Research during its 61st year. While these 12 months have passed, long-established sovereign states have ceased to exist and new nations have been born. The United States and its

global economic partners have witnessed one of the worst recessions of the century. The Society for Pediatric Research occupied new offices in Chicago. Forty million Americans had no medical insurance, and a third of the children in the land continued to live in poverty. I moved to San Francisco and became Chair of a department of pediatrics. A basketball star and a tennis great announced that they had been infected by the human immunodeficiency virus. Several thousand infants who had also acquired this pathogen were born in this country. Apartheid ended in South Africa. Minorities in the United States continued to suffer social and economic discrimination, which led to the destruction of portions of several of our major cities. The Society for Pediatric Research council met twice, elected 85 new members, and planned meetings through the year 2003. The National Institute of Child Health and Human Development funded eight new Child Health Research Centers and the NIH spent 8 billion dollars on research while the Department of Defense committed nearly 300 billion dollars to keep us ready to fight in the next Gulf war. During the course of all these events, I grew a year older, not very much wiser, and served as your President.

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