

INTRODUCTION

THIS FIRST INTERNATIONAL MEETING on the mechanisms of growth control was held in Syracuse, New York, September 26-28, 1979. The impetus for the meeting was the significant progress made in regeneration research during the past three decades. This research had clearly established that regenerative growth could be stimulated to occur in a number of animals not normally possessing that ability. Other findings of importance reported over the same period were the establishment of the dependence of regeneration upon nerve supply and the involvement of certain electrical factors in the process. In this latter area of electrical factors, the clinical specialty of orthopedics had made substantive contributions. Bone had been shown to be a solid state electronic material and two of its normal growth processes, the growth response to mechanical stress and the healing of fractures, were shown to be related to these properties. A decade of such research had led to clinical experimentation in which the actual stimulation of a growth process in a clinical setting had been demonstrated for the first time.

In a series of conversations between myself and Steve Smith, the need for such a conference became apparent. We conceived of it as furnishing both a "bench mark" for future research and a base for the initial sharing of interests and problems between the relevant basic scientists and clinicians. Dr. Vernon Nickel, Chief of the Veterans Administration Rehabilitative Engineering Research and Development Service, was approached and provided both enthusiastic personal support and much of the necessary funding. The remainder of the funding was provided through the good offices of Dr. George Reed, Dean of the College of Medicine, Upstate Medical Center, State University of New York. Dean William Minerod of the Office of Continuing Education at Upstate provided both logistical support and served as the official host.

Following this ground work, it became apparent to both Dr. Smith and myself that a broad representation of ideas and disciplines was essential to the success of the meeting; hence a steering committee was organized representing both the basic and the clinical sciences. In addition to Steve Smith and myself, Drs. Meryl Rose, Anthony Schmidt, Marshall Urist, and Andrew Bassett constituted this committee, which was responsible for planning the structure of the conference and its agenda. Much of the success of the conference is directly attributable to the hard work of this

committee and the enthusiastic support of the administrative representatives of the Veterans Administration and Upstate Medical Center. The major contributors to the success of the meeting, however, were the speakers and the participants themselves. The papers presented were uniformly of the highest quality, representing truly the "state of the art" at this time. Discussions of the papers were vigorous, in many cases continuing after the formal sessions had ended. In a survey conducted on the last day of the meeting, the overwhelming majority expressed the opinions that the conference had succeeded in its stated aims of providing a base for future experimentation and a forum for interfacing between the clinical and basic sciences.

As part of a vital, expanding discipline, the conference cannot be summarized except on the broadest terms. However, a number of extremely important general conclusions may be drawn from it. First, it is clearly evident that the capacity for regeneration in the mammalia is far greater than previously thought. Second, sufficient basic knowledge of the controls over this growth process is presently at hand to enable some measure of it to be deliberately stimulated in situations where it normally would be lacking. Third, the key role played by electrical factors in this process has been established. As a clinician and surgeon who has dealt with problems of growth and healing for the past three decades, the prospect of having effective control over these functions is exciting indeed. It is my personal belief that the principles and concepts enunciated at this conference may well be the basis for a truly new medical science.

As program director during the meeting and editor of this volume, it has been my pleasant duty to interface with all of the speakers during the meeting and later to gather all of the material together into a form suitable for publication. I wish to express my thanks to Mr. Payne Thomas for his help and understanding with the latter task.

Robert O. Becker, M.D.
Conference Chairman