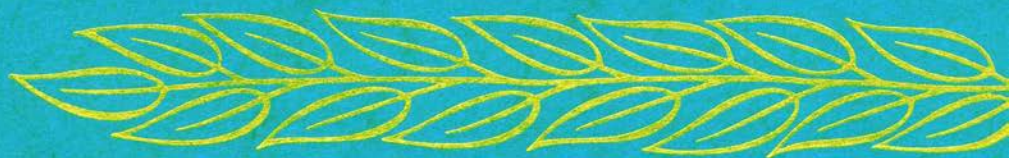


1897



1975



RECOLLECTIONS OF DETLEV W. BRONK

*by colleagues and friends
at a gathering in Caspary Auditorium
on February 18, 1976*



THE ROCKEFELLER UNIVERSITY

NEW YORK CITY

Frontispiece: *Detlev and Helen Bronk, Pocantico Hills, New York, 1965*

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Frederick Seitz

WE ARE HERE TODAY to pay homage to one of the great scientists and leaders of our times — a man who combined great personal warmth and humanity with a highly unusual vision of the place of science in our country and of our country in science. The debt the nation as a whole, and the scientific community in particular, owes to him is large and ranges over a variety of horizons.

Our University is only one of several institutions to which he devoted himself. The evidence of that devotion, however, is apparent on all sides of us here on our campus. On the one hand are the transformations he wrought through his intimate personal influence on everyone who was here during his many years with us as president, as advisor, and as friend. On the other are the scientific enterprises which he added to the campus and the more intimate ties he formed with the national academic community — epitomized by the addition of a graduate school.

Creative sciences came to our country on a significant scale relatively late in its history. In fact, it came to full flowering only in this century, in the main, in the period during which our own institution has existed. That science ever thrived at all in this new world is a result of the striving — often through bleak years — of a long chain of highly unusual men. The significant list starts with Benjamin Franklin, and carries on through the past century into our own with such names as Joseph Henry, Louis Agassiz,

Benjamin Pierce, Henry Rowland, Walcott Gibbs, Ira Remsen, William Welch, Charles Walcott, George Ellery Hale, Frank Lillie, and Karl Compton. Detlev Bronk, who carried on his mission in times that contained a fair mixture of both the austere and the friendly, was of that same breed. Indeed, it was he who, among many other things, saw into their flowering in support of the basic sciences what have been among the greatest years to date of the National Academy of Sciences, the National Science Foundation, and the scientific advisory office of the White House.

If one examines Det's personal and professional accomplishments in perspective, many remarkable characteristics come forth prominently. There are, however, two outstanding elements which I would like to mention. First was his profound belief in the need for the understanding and cultivation of people as individuals. This is not to say that he was a populist—far from it. He inevitably sought out and cultivated, with an uncanny sense of judgment, the most enlightened and capable and brought them together into a remarkable community or family. This quality was most apparent during his years at the Academy, where I was privileged to see him in close action during his 15-odd years of service as Chairman of the National Research Council and President of the National Academy of Sciences.

The second great gift was his ability to see that, whatever else it might do or be, science could not in the long run serve two masters. It has continual need to thrive on its own roots and in its own special soil. This view was based on the belief, which was an essential part of his makeup, that the enlightenment engendered by basic science has a value to mankind that is beyond question.

DR. SEITZ is President, The Rockefeller University.

Apart from all these matters is the very special human being whom we all loved and admired. He was always intense and dedicated, never dogmatic. He was normally warm and friendly to all of us, but if provoked he could be sharply critical of the underinspired or the bigoted. Woe to the individual who did not appreciate the importance of the mission he had accepted or to the taxi driver who showed racial discrimination.

No one could lead his multidimensional life without the understanding and support of those upon whom he depended for sustenance and health. We are all deeply grateful to Helen Bronk for her devoted care through so many strenuously active years, just as we are also grateful to Mabel Bright, for her unending range of services to both Det and Helen — services which encompassed everything from office manager to boatswain on *King Haakon*.

While we all lament Det's unexpected passing, let us also today express joy at the pleasure and privilege of having been able to know and work with him.

H. Keffer Hartline

WHEN I ARRIVED at the Eldridge Reeves Johnson Research Foundation early in 1931, it was only a little over a year old but already a going concern. Research was being conducted vigorously in a dozen laboratories: biophysical studies of muscle, nerve, receptors; biological effects of ultra sound, X-rays, and alpha particles. It is evident that Detlev Bronk had lost no time in getting things rolling. Det was the ideal director for such a foundation, trained in engineering, physics, and physiology, and with broad interests and wide-ranging enthusiasms.

No one was more vigorously busy in laboratory research than Det himself. In those first years, his interests were centered on the nervous regulation of the circulation. In a Harvey Lecture, he said: "The coordinated control of the heart and bloodvessels is one of the most important and remarkable reflexes in the organism; because the circulation supplies the essential and varying needs of the complex body, it can best fulfill its functions under the integrated control of the nervous system."

In the late 1920s, Det had studied in England, where he investigated heat production by muscle with A. V. Hill and electrical activity of nerve with Lord Adrian of Cambridge. In Adrian's laboratory, methods were developed for recording the activity of single units of the nervous system. Indeed, the classic paper by Adrian and Bronk on the activity of single fibers of the phrenic nerve is the definitive publication of this important new

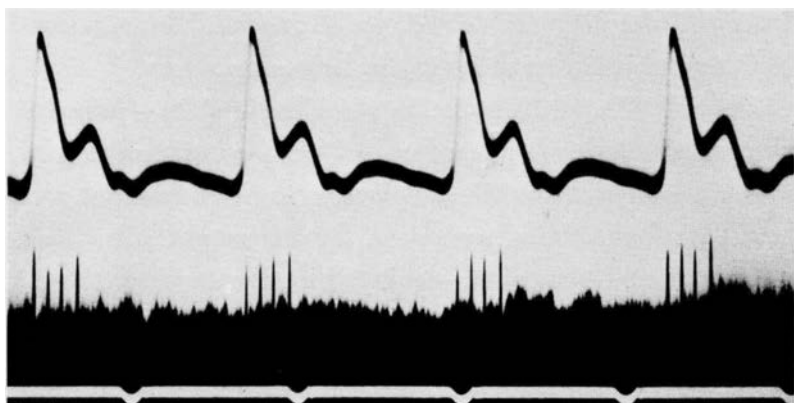
era; the unitary analysis of nervous function is today a fundamental method in neurophysiology. It was this new method that Det exploited in his early research in the new Johnson Foundation.

Receptors in the walls of the large arteries regulate blood pressure by signaling its level over afferent nerve fibers to centers in the brain. From single fibers dissected from the carotid sinus nerve, Bronk and his colleagues recorded the sensory messages from the baroreceptors that respond faithfully to changes in arterial pressure, increasing or decreasing their frequency of impulse-firing as pressure rises and falls. From this sensory inflow, the vascular centers initiate reflex motor outflow over the sympathetic and parasympathetic nerves to the heart to speed it up or slow it down, and to the blood vessels to constrict or dilate them. This nervous action was recorded in detail by Bronk and his colleagues. "Thus," Bronk said, "the circulation is under a self-initiated control." Truly fundamental cardiovascular physiology.

The papers published in 1932 and 1935 by Bronk and Eliot Stellar describe this work. In a recent number of *Physiological Reviews*, an article on arterial baroreceptor reflexes states: "These authors [Bronk and Stellar] had already elucidated in principle most of the fundamental properties of the baroreceptors known up to now" — this more than 40 years later!

Of course, Det had other research interests. The experiments on the sympathetic nerves and ganglia led to the study of the mechanism of synaptic action. In another study, single nerve fibers to the intercostal muscles yielded beautifully integrated patterns of the impulse discharge that controls respiratory move-

DR. HARTLINE is Detlev W. Bronk Professor Emeritus, The Rockefeller University.



Action potentials (lower trace) from a single nerve fiber recorded by Detlev W. Bronk at the Johnson Foundation in 1932. These oscillograph recordings show clearly how pressure receptors in carotid sinus respond at each increase in arterial blood pressure (upper trace). This sensory information, transmitted to the central nervous system, is essential to neural regulation of the blood pressure.

ments. And Det's interest in oxygen transport — at the root of all this research — stimulated him to foster the development of the oxygen electrode for measuring the oxygen concentration in brain and other tissue. He assumed other responsibilities that took him from the laboratory, but he never lost enthusiasm for a good experiment.

Perhaps this brief sketch will remind us of what we already know: Det Bronk was a first-class scientist. He was a superb experimenter, a creative interpreter of scientific observations. He held the highest standards of excellence; his scientific papers are models of clarity. He was a teacher by example — of graduate students and, indeed, of most of his associates, as well. It is because of these virtues, and this intense and productive career in the laboratory, that Det was able to achieve what he did for

American education and for science in general. He understood scientists and could speak for us, for he was one of us.

The early Johnson Foundation was a lively place — informal, friendly, stimulating — its tone set by Det. We were free to work on what interested us. We also were free from financial pressures; Det found funds, somehow, for our support. On weekends we often — very often — enjoyed the incomparable Bronk hospitality at “Hill House,” the lovely home Helen and Det had built at Sycamore Mills in Pennsylvania. Plenty of outdoor activity: skiing, when there was good snow (Det was an avid skier, then and through the years), then a warm fire; banter, discussions, and a lot of shop talk, much of it good science — at least until the drinks came round. And then a superb dinner under Helen’s gracious ministration.

Few activities meant more to Det than sailing. In recent summers, in his tall sloop *King Haakon*, he and Helen, Mabel Bright, and usually Adrian or young Mitchell Bronk, cruised the coast of Maine. Before that, there was a splendid schooner, *Buccaneer*. It was earlier, in his yawl *Tern*, that I did most of my sailing with Det: the Chesapeake, Block Island, and Cape Cod. Sometimes Helen joined us — occasionally Ramsey Bronk, then a small boy. Strange how the many fine moments of sailing melt together into unresolved recollections of pleasure, while some specific incidents, more comfortably enjoyed in retrospect, stand out in detail. One November evening we had a rough, cold beat up Delaware Bay (a miserable body of water). Not until our keel bumped over Elbow of Ledge shoal did we know exactly where we were, but at least that let us find our way to welcome, but cold and uneasy, shelter off a New Jersey cultural center named Bivalve. We might have avoided that wild, beautiful ride, white

seas under a full moon, had we heeded the storm warnings flying on Cape May. But Det didn't really believe in storm warnings; he considered them a challenge. And he said, perhaps not entirely in jest, "They are *small* craft warnings." Our vessel was 28 feet over-all. From sailing, Det derived refreshment of spirit and replenishment of the zest which marked whatever he did.

We received, the other day, a note from Ragnar Granit to be read at this gathering. Ragnar, who became Director of the Nobel Institute for Neurophysiology, Stockholm, was the first staff member to be appointed to the Johnson Foundation.

"On this occasion my thoughts go back to the moment when in 1929 we, my wife and myself, first entered the premises of the newly instituted Johnson Foundation and met the young couple, Helen and Det, responsible for its welfare.

"Never shall we forget the warmness of the reception, and now, when Det is gone, we grieve for the loss of a devoted friend whose loyalty of attachment has lasted over the years and given us much joy. The same loyalty and devotion, as in personal relationships, he bestowed on everything he did, never husbanding his own strength in a commendable cause. And so he emerged victorious in whatever he wanted to accomplish. This influence reached far beyond the boundaries of his own country. He will be remembered with gratitude by a vast number of friends and institutions all over the world."

Britton Chance

DET'S RELATION to the Johnson Foundation and the University of Pennsylvania is epitomized in a letter he wrote in 1969 on the occasion of the award of the National Medal of Science. "It was at the Johnson Foundation that I was able to do scientific work and where I was able to begin the public services for which the medal is awarded . . . whatever I had done that is worthy of consideration truly had its birth at the Johnson Foundation." Det was unique in what he had to offer the world, and humble in the way he gave it.

I will speak to the point of Det's life during that fantastically productive decade of the 1930s, and from the unusual perspective of having served two terms as Det's "stand-in"; in 1940, and again in 1948, Det and Newton Richards entrusted to me the pro-tem directorship of the Johnson Foundation. In and out of these transitions, I believe that Det and I became closer and closer, as I strove better to understand his ideals of research excellence in the Camelot of learning that Det had built at the Johnson Foundation.

I soon found that Det was captain of the ship, a natural-born leader, as I was happy to learn, on both sea and on land. The excitement of the sea, its surprises and challenges, its beauty and power, appealed to Det. His attachment to *Buccaneer* was characteristic; her destruction in Hurricane Carol on the sands of Woods Hole was a deep and personal loss. It was more than a

*First Graduating Class, 1959;
(left to right) William F. Arndt, Jr.,
Suydam Osterhout, David Rockefeller,
Chairman of the Board of Trustees,
Detlev W. Bronk, President, Lee D. Peachey,
Harold J. Simon, and Howard Rasmussen*





year before Det could bring himself to accept her successor, discovered in Norway. He then loved *King Haakon* as he had loved *Buccaneer*, with an enduring passion, an intense pride in her performance, and a sensitivity for her welfare. I never cruised in the same boat as Det, but we covered the same range of emotional responses; I can tell that at sea he was eager to cope with nature on her own terms, in one of the few remaining arenas where one can pit one's wits and resources against the unknown.

This attitude toward the sea explains much about Det's career on land. The challenges stimulated him, and indeed there was no barrier so high or so unexpected that he could not assail it — in research, in academia, and on national and world scenes — and come out, characteristically, on top.

Det was simultaneously an engineer, a physicist, and a physiologist; remarkably enough, he could publish in the same year, 1927, papers on the infrared absorption spectra of gases and on the effects of carbon dioxide tension on carotid and femoral blood flow. He was able to bring a variety of disciplines to bear upon a single problem. The early meetings that Alfred Stengel set up for Det Bronk and Eldridge Reeves Johnson must have been extraordinary in their mutual trust and understanding of each other's gifts and motives. Perhaps it was because both Bronk and Johnson loved the sea, both were keen judges of men, and both could see far into the future, that they had confidence that each could achieve the other's goals. The purpose of the Johnson Foundation was "the study and development of physical methods in the investigation of disease and its cure . . . ; the study of the important physical agencies . . . in their varied rela-

DR. CHANCE is Director, the Eldridge Reeves Johnson Research Foundation.

tions to the life of man” It is obvious that the articles of incorporation of Det’s first endeavor bear the stamp of his mind and laid a viable blueprint for the decades to come. Keffer Hartline has told you how Det gathered together a critical mass of scientists who lived together, wrestled with scientific problems together, and, each in his own way, succeeded in that most difficult of tasks, creativity in science.

What were his leadership qualities? Just as Det was the captain of his ship, so was he the captain of his laboratory — a perceptive and sensitive captain, deeply involved in the function of the laboratory and, most important, the function of the people who gathered there. Det cared for people, not in an ordinary way, but in a very special way that embraced the totality of their existence. His was not an idle concern; it ran the gamut of people’s lives and the gamut of the range of people, as well. He was just as interested in the performance of Tom Redmond, the janitor, or Vic Legallais, the young shop apprentice, as he was in that of his most brilliant colleagues, Keffer Hartline and Ragnar Granit. Yet his interest was prudent; in fact, he never had to “direct” the research work, for his own example clearly identified the standards that he set for himself and demanded of others. Just as he cared that *Buccaneer* or *King Haakon* be shipshape, that there be no dents or chafe marks on the rails or barnacles on the keel, he cared for the quality of life in the laboratory and for the success of his colleagues. This was the natural way for Det to live, for he believed that only in this way could the real satisfactions of life be achieved.

Obviously, such a way of life needed basic supports, and it was Helen who provided the stable platform for Det in the rough seas, and surely made it possible for him to expose to his

friends and colleagues only the peaks of his many happinesses, and not the lows of his despairs. It was at Hill House Farm where Helen's warm hospitality welcomed all, and where Det himself was like a beacon for those who came to him for counsel and guidance throughout their careers — as, indeed, has been the case with me.

Det was, as well, a prudent, frugal man. One has only to look at the total budget for that first year of the Johnson Foundation, described by Keffer Hartline, to find it less than two postdoctoral salaries today. Yet Detlev Bronk, Ragnar Granit, and several others were all there in the first years. He was a top-notch administrator and, on the two occasions when I acted as pro-tem director, I marvelled at the responsibility of his fiscal policy and his ability to find support for his colleagues.

We may speak of the Johnson Foundation as a Camelot of learning or an ivory tower of intellectuality, but we find that, at the same time, Det's broad vision, infectious enthusiasm, and scientific momentum carried him into the uncharted waters of clinical medicine. As the charter of the Johnson Foundation mandated, he carried on investigations of disease and its cure, initiating a new interdisciplinary program. For example, his life-long work on oxygen from the standpoint of cardiovascular control, on the regulation of oxygen delivery to organs, particularly the brain, laid the foundation for collaborations with neurologists and for the establishment of the Neurological Institute, the predecessor of that so ably directed by Louis Flexner and Eliot Stellar in the more recent past. In fact, Det's interdisciplinary activities set the pattern for the current NIH Centers and Program Projects that bridge the gap between the basic and clinical sciences. His continual support for the unification of the sciences is epito-

mized by the University of Pennsylvania's Bicentennial theme of "one University." In addition, it gives special impetus to establishing in the Johnson Foundation laboratories a D. W. Bronk Institute of Membrane Biology, as a living memorial to the man who so effectively joined physics and physiology to the clinical sciences.

His ethic of maximum effort, of community spirit, of group enthusiasm, carried Det through his golden decade of the '30s to the larger responsibilities required of him in the Air Surgeon's office, in the Presidency of Johns Hopkins, in the National Academy of Sciences, and here at The Rockefeller University. To these, and many other duties all over the world, Det labored, as Mr. Rockefeller has so elegantly described it, "in the advancement of civilization today and tomorrow."

Johns W. Hopkins III

WE ARE HERE this afternoon to honor Detlev Bronk, a distinguished scientist, an eloquent spokesman for science, and a warm and supportive friend to many of us. I first met Det Bronk in the spring of 1955, when he was transforming The Rockefeller Institute for Medical Research into a University, and was recruiting the first class of Graduate Fellows. I was fortunate to have been in that class, which entered the same fall. In a way, I suppose I have the honor of speaking on behalf of the 275 alumni of the University and its present body of Fellows, as well as for myself.

Some weeks ago, when I heard of Det's death, a series of vivid, but disconnected, memories flashed through my mind. As I thought about them further, I realized there was a consistent pattern to those memories, a pattern that revealed Det's unique characteristics and personality. Let me share a few of the memories with you; some are familiar to many of you in this auditorium, others are mine alone. A few are somewhat trivial. I apologize for being personal, but prefer it to vague generalities.

My first memory is of a letter from Det announcing the founding of a new and great university, staffed, in his words, by a "galaxy of scientific stars." Graduate Fellows would have the opportunity not only to learn science, but to become working scientists immediately, accepted as colleagues by distinguished faculty members.

The next memory is shared by many who were here in the early years of the Graduate Program; a long and probing interview with Dr. Bronk. He skillfully but firmly explored our intellects and personalities. Part of my interview took place at lunch, and I managed to spill spaghetti sauce all over my shirt and tie. Det tactfully kept eye contact with me and never acknowledged the accident.

Nine other students and I were admitted that summer, and the next I heard from Bronk was a handwritten note congratulating me on my engagement, an announcement of which he had seen in the *New York Times*. Typically, the note was postmarked Gander, Newfoundland, where his plane had stopped for refueling on its way to England.

I next remember The Rockefeller's first classroom — an impossible design, for which Det, and Det alone, was responsible. I think it was his interpretation of the choir stalls in a medieval English cathedral, perhaps his favorite, the one at Ely, near Cambridge. The graduate fellows sat high along the walls, surrounding the lecturer, who paced nervously in a lower central arena; the scene was right out of the Spanish Inquisition. Most marvelous of all was the blackboard, effective only in pitch darkness when used with fluorescent chalk and an ultraviolet light. We learned much in that room, but I shall always have a special sympathy for the brave faculty members and friends of Det who endured the ordeal. Professor Rabi and Professor Hartline, I'm sure, remember that room from the lecturer's perspective.

I almost left out the next item because it seems too improbable to be true, but I checked with Mabel Bright, and she assures me

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my memory hasn't failed. I was driving south on the New Jersey Turnpike late one Friday night when a familiar gray Jaguar pulled up beside me to pass. In it were Det, who was driving, and Mabel Bright, sitting beside him wearing a miner's lamp and taking dictation. Mabel says it was a common routine on weekends as they headed to Washington or to Pennsylvania.

Next, I remember the first Convocation here, held in 1959. Its academic procession was led by Det and, I believe, Mr. Rockefeller. Following them in brilliant array were the chief officers and representatives of the world's oldest and greatest universities — presidents, chancellors and vice-chancellors from three continents. These men were the recipients of this University's first honorary degrees.

My memory then skips to the late 1960s, when I was planning a dedication ceremony for a new laboratory building for my department at Washington University. Det was asked to speak, and he interrupted his busy schedule in New York and Washington to come to St. Louis and deliver a carefully prepared address. By forcefully presenting his vision of the interrelationship between science and society, he effectively inspired the donors to keep giving the material things necessary for science, and the occupants of the laboratories to work ever-more creatively in basic biological research. Det must have dedicated dozens of buildings, but on this occasion he sounded as fresh and as excited as if it were his first such experience.

My final memory of Det was the last time I saw him, three or four years ago, and I shall always treasure it. We were in Bangalore, India. It was two o'clock in the morning in a hotel bar, and Det was scheduled to take a plane back to this country at dawn. We were among a small group of biologists who had

been invited by the Indian government to discuss ways in which science education and research in India could be made more effective. Det was plying the officers of the Indian Academy of Sciences, the University Grants Commission, and a Vice-Chancellor or two with bourbon, and presenting exactly the arguments he must have used 20 years before on Mr. Rockefeller and the trustees of this institution. But this time he was arguing for the millions of Indian students he would never see. He laid out the case for drastically revised and more flexible curricula, for interdisciplinary work, for realistic and meaningful research programs, and for more efficient management of universities. Always in his arguments he identified with the young generation; let the student and beginning scientist have more freedom, let him choose his own path, trust his initiative and intellect, don't weigh him down with the mistakes of the past.

What do these arbitrarily chosen fragments tell us about Det Bronk?

First, he was a man who liked people, genuinely liked them, not for what he could gain from them, but for their own sake. He cared about names, places, details of personal life, and filed them away permanently in his prodigious memory. He had faith in individuals and he had faith in mankind. He felt with certainty that proper application of man's intellect could lead to that long-sought-for Heaven on Earth. It was the role of science to discipline and focus the intellect. He had complete confidence that benefits for all men would be forthcoming if only those of us lucky enough to be scientists would keep our heads on straight and work a little harder. And he knew that he could have an influence by supporting young men and women who had a scientific potential.

He believed in universities — all universities — as the most noble of human institutions. In another century, he might have been a churchman, but instead he was born to be a university-man. Det often spoke of the university as the place where people come for unfettered exchange of ideas, without regard to geographical, political, or religious boundaries.

That first convocation at Rockefeller was the public affirmation of Det's magnificent plan: to add The Rockefeller University to that evolving chain of great Western universities that began nearly a thousand years ago and, if Det was right, will go on forever. Basic science was in a central position in Det's University, but not at the expense of the arts and humanities. He had little patience for the narrow technologist. His ideal was the Renaissance Scholar.

In honoring Det, we also honor his wife, Helen, who quietly and unselfishly supported and encouraged him from their student days until his sudden death. We owe her a very great deal.

It seems to me that a memorial service should do more than honor the dead. It should elicit new reflection and new dedication from the living. I think Det would have wanted to tell all of us who are associated with research and teaching to work a little harder, to put a little more faith in the student, and to make sure that The Rockefeller or any other university, and the enterprise of basic science, are passed on to the next generation in better and more effective condition than we found them. Perhaps most of all he would want to reaffirm his belief that, in this or any other endeavor, human relationships and human dignity must be paramount.



Dedication of Avery Memorial



Gateway, 1965; (left to right) Colin M. MacLeod, Maclyn McCarty, and Detlev W. Bronk

William O. Baker

DR. DETLEV BRONK, although born at the end of the nineteenth century, will be remembered as a twenty-first century scientist and leader. For Dr. Bronk foresaw early, and fostered elegantly, the new strategy of science and technology, indeed of education and of public affairs. This idea extends the work of the heroic individual, through the sharing of tasks with the group and the community. This concept, rooted in the engineering sciences and technology of the mid-twentieth century, has been slow to come to the life sciences, where both the tradition and method of learning and discovery still favor the lone, and sometimes lonely, scholar.

Of course, Det Bronk knew very well, as all who do research must know, that insight and discovery do come from the single mind, from the devoted individual. But he also long foresaw that, for science and learning to belong to all of humankind, there should be aggregation and structure of communities right along with the freedom and independence of persons. It is that quality I have known so intimately in Det Bronk, and to which I pay tribute in the conviction that his good works in behalf of delegation and community, of structure and institution, in science and learning, will carry us forward as a major element in the twenty-first century. How impatient, indeed scornful, he was of the movements of the 1960s and '70s, which rejected

organization and assaulted our establishments with a mindless nihilism.

Det Bronk expressed this principle of organization in the paper he delivered at a conference of the National Science Foundation in 1970, after he had completed, some years before (in 1964), a 14-year term as member, and had been for 9 years (1955-64) Chairman of the National Science Board. In that paper he said, concerning frustrations of man in modern life: "This eroding frustration is due in part to two salient characteristics of the pattern of life most men live today. The first is this: the capabilities of man have been vastly augmented. And the second: a man alone does not possess those augmented powers. . . . When man first learned to use a lever, the power he could exert was increased forever; he needs the assistance of no one other than himself. The force exerted by man who controls a nuclear device is vastly greater, but it is derived from a vast system of men and women."

Det followed this doctrine of "a vast system of men and women" skillfully in all the years he cultivated the great institutions that he served. It was a delight to partake of his beliefs in the years when the National Science Board was playing its strongest role — in the major growth of the National Science Foundation and its seminal part in the formation of the White House Science Office. Dr. Mannie Piore was a valued associate in this activity. We should recall the breadth of the arena in which Det exercised these ideas of community and delegation of faith in institutions and of the ability of others to work together in ways beyond what anyone could do alone. Thus, as

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President of the National Academy from 1950 to 1962, as President of the AAAS in 1952, and as President of Johns Hopkins and then The Rockefeller University, he mastered in many ways the often overwhelming difficulties of creating communion among the individualists in the nation and the world who were premier in research and teaching. Although he could easily have been diverted by the momentum of the institutional role, he never forsook in any way the individual and personal part. A skillful knowledge of what colleagues were doing was aided by such associates as Mrs. Mabel Bright. Thus, following his vision of the destiny of The Rockefeller University, he said in his first convocation address in 1959, "The explosive growth of populations requires much wisdom for the preservation of the precious intimacy of relation between a scholar and a scholar and between scholars and those in other walks of life." Indeed, it was the sympathy and aptitude for organizing that gained Dr. Bronk the respect and affection of the leaders of government and of industry, enterprises in which the academic world has not always found complete congeniality.

In our own endeavor at Bell Laboratories, my predecessor Dr. Frank Jewett, who was President of the National Academy of Sciences some years before Bronk's term, developed high regard for Det. Jewett's successor in our Laboratories, Dr. Oliver Buckley, was deeply befriended in his task as the first Presidential Science Advisor (to President Truman) by Det Bronk's keen appreciation of how to connect the institutions of the academic, governmental, and industrial worlds. Thus, when others of us were called by President Eisenhower and his successors, right up to the present time, to marshall the broad base for science and learning, for technology and its applications in our nation, every



Doctor honoris causa, Université Libre de Bruxelles, 1963

phase gained help and heart from Det Bronk's deep commitment. This was his principle: that the bonds between people, the understanding of friends, the recognition of talent, would indeed lead to a natural strengthening and interaction of institutions, and not be in conflict with their rapport.

I have often heard him express joy in the way his successors, Fred Seitz in the Academy and then at the University, Brit Chance at Pennsylvania, Phil Handler at the National Academy, and others in government, have carried on in the face of assaults on universities, academies, industry, learned societies, even parts of government. He believed that such institutions could indeed reflect the best of personal meanings and actions, and should not be viewed as antagonists of individual integrity and self-realization.

Dr. Bronk applied his beliefs in institutional and individual affinity, and the essential community of scholars and leaders, in many effective forms. Following his historic proposals for the future of The Rockefeller Institute, after formation of the study committee on October 26, 1951, Dr. Bronk proposed interaction of both the faculty and students of the still-hypothetical graduate university by having them spend time at other universities, both near and far. When the new chairman of the Institute, David Rockefeller, took the next finesse, and persuaded the author of the report to become President of the new University, Det Bronk's concept of institutional interaction expanded still further, to the notion that distinguished researchers in other places might perfectly well do even more at The Rockefeller. Therefore, they should not be denied the opportunity even to become permanent members of the faculty at the new University!

This strategy was viewed with reserve by some deans and

presidents, who emerged into an era of greater collaboration than they had imagined. But Dr. Bronk balanced this opportunity for the administrations of other institutions to share, with a charge to them to select the very best life-science students among their undergraduates. These could then apply for admission to the new University. In writing to presidents of eminent liberal arts colleges, requesting nominees for the initial class for the 1955-1956 academic year, Det pointed out the range of opportunities available. He noted: "We will thus encourage the student to utilize, insofar as possible, the total intellectual resources of the democratic world." This was Det's characteristic span of definition of what was expected from those worthy of bold innovation. We might even call it the Det-unit, measured by Det-termination!

In the same letter, he described some of the policies of the new University that have been particularly notable in the mid-century. He said: "The unity of science which will be emphasized by lack of departmental barriers, and through our associations with other institutions, will be of special value to the student." Others will say and have said what came from that selection, and from all the classes since, when the first ten, as Det put it in his report, "courageously and cheerfully joined with us in our new venture."

We need hardly say that the experience of the trustees during Det's tenure was no less demanding than that of the students. Led by Chairman David Rockefeller, who fully matched Det's zeal for frontiersmanship and excellence, we became progressively informed on examples of how to make the institution respond to relentless, but always cheerful and expectant, demands for progress. Whether it was for approval of a seductive

call to another illustrious scholar for the faculty, for the Tower Building Committee to house new work, or for the Kiley landscaping to delight the eye, Det never let a trustee languish.

But, of course, that had always been his way. For instance, his founding and initiating role in the National Science Board, after his appointment by President Truman as a Charter Member, was good preparation for his chairmanship from 1955 to 1964. The period through the 1960s saw the greatest growth of the National Science Foundation and its profound influence in the national community of research and education. The many week-end meetings, orchestrated by Det Bronk, in which the Centers of Excellence programs, new curricular supports, national research institutions from the Antarctic to the Rockies, and many other activities were conceived and pursued, represent an historic phase of Federal science and education. His relation with Congressman Albert Thomas, the crucial chairman of the Appropriations Subcommittee of the House of Representatives, was a particular delight to behold. They shared a zest for life and people which established lasting rapport. Those of us who attended the annual hearings in the period, when the budget and role of the Foundation were growing steadily, were charmed by the solid and confident exchanges between the master politician from Texas and the politic master from nearly everything else, including the National Science Board.

His virtually concurrent role, from 1950 to 1962, as President of the National Academy of Sciences, was national good fortune that linked the independent and the Federal communities of science together in their work for the public benefit. Although my term on the Council of the Academy came after Det's retirement, he was a faithful honorific attendee during the difficult

times when the Engineering Academy and the Institute of Medicine were being assimilated. Often, he was able to calm the zealots for a cause — to the delight of Fred Seitz or Phil Handler, as the case might be — by a casual reminder that nobody ever got everything he wanted (although it has occurred to his devoted friends that Det usually came very close).

So, in these few minutes, we have sampled the doings of a life whose good will be felt for generations ahead, as it has already for generations gone by. Above all, as a twenty-first century man, Det had an abiding conviction that institutions, which after all were made of people, would indeed serve people well, given their humanity. What a blessing for all of us — universities, government, industry, and society — that he and his fine family had so much to give and gave it so fully.

He made real those noble words of the Old Testament (Proverbs 11:14 and 15:22):

For lack of statesmanship, a nation sinks: the saving of it is a wealth of counsellors. . . .

When no one is consulted, plans are foiled: when many are consulted, they succeed.

I. I. Rabi

TODAY IS DEEPLY SADDENING for all of us. I had hoped that one day Det would be called upon to deliver a memorial service for me, because, knowing him and his enormous resources and durability, I thought he would live into the twenty-first century.

I'm different from most of the people who have spoken today, in that I never worked for Det or served on any of his vital committees, but I knew him for a long time; when I first met him is lost in the mists of antiquity. Even then, I felt I had known him a very, very long time; that I had been an intimate friend of his, in the sense that he was concerned about all aspects of one's family, aspirations, achievements. I always admired that quality in Det. When he turned The Rockefeller Institute into the University, and personally recruited all the students, it was amazing to me how he could remember each and every one of them, their characters, their relatives, their friends. My own abilities in this regard were so minor that, with a class of ten, I hardly knew the members at the end of the term. But he went even further. He seemed to know all the members of the National Academy of Sciences in the same friendly, intimate way.

I, of course, know only one part of Det; his tremendous deeds of derring-do on the ski slopes and on the sea were foreign to me. I wish I'd partaken of one just once; it would have strengthened the fiber of my character. The stories we've heard today

are awe-inspiring — they make your flesh crawl — but of course, they're not unexpected, because Det started early in the most daring of all occupations. He was a Navy aviator in the first World War, and if there are stronger manifestations of madness, I don't know them.

Basically, in watching his career, I decided Det was truly an aristocrat. He could meet with any group, anywhere, on the most easy and friendly terms. He was an aristocrat in the sense that he was not upset by small things, and was never awed by people. They were all just people to him, and he could penetrate to their nature very quickly. He could recognize a phony immediately. In his science, too, he had the uncanny ability, which has been described by his collaborators, of being able to separate the important from the unimportant almost instantly.

His mind roamed broadly; not so much philosophically, but with an intense, American practicality. His ideas on education made themselves felt in a highly practical way at The Johns Hopkins University, for example. There, by abolishing the differences between graduates and undergraduates, he gave a new opportunity to the brilliant and the industrious to advance as fast as they would. I know people who took advantage of that opportunity. They were inspired, and moved on quickly while they were still young enough to retain all the initiative and dreams of youth. I saw the same thing here at The Rockefeller. Those he selected were extraordinary people, and he had the unique idea of giving them their head. They were paid enough at that time to go off campus to study any subject not taught here and in which they were deficient. In all cases, Det was concerned for the development of the individual.

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U.S. Scientific Mission to Japan, 1948; (left to right) E. C. Stakman, I. I. Rabi, Detlev W. Bronk, Zay Jeffries and Roger Adams

Here I must mention an incident which perhaps will bring Det closer to some of you who may not have known him so well. In 1948, we were invited to go to Japan and help out the Emperor (who, in this case, was General MacArthur, not the Mikado) by investigating what the occupation forces were doing for science in Japan. We had an extraordinary group: Det was the leader, and the others were the late Roger Adams, the great chemist; E. C. Stakman, the biologist; Zay Jeffries, the metallurgist, and I. We were treated the way the Bible says a king treated those he delighted to honor. We had our own train, complete with a dining car, cooks, interpreters, and an American officer to see that all went well. We stopped here and there and invited

the Japanese aboard and let them sample American drinks. One morning as we were going through some station, I looked out from my berth. There were the stationmaster and his assistants standing at attention and then bowing as the train went by. It was a nice way to live.

We went the length and breadth of Japan, and the Japanese invited us to some feasts, complete with geishas. Sometime those meals were extraordinary. The first course might be ham and eggs, followed by traditional Japanese food, including raw fish and saki. At one point, Det was unfortunate enough to catch a very bad cold. A lesser man would have had another of the group take over the leadership. But Det never faltered at all, in either hours of rest or hours of work.

One thing all of us who have had close relations with him will appreciate. At one time, he had to make a speech to the assembled Japanese scientists who were organizing a science committee based more or less on the American system. Now, we had two interpreters, one a Nisei from Hawaii, the other a native Japanese. The Japanese scientists preferred the native Japanese interpreter, and we preferred the Nisei, because we could understand him when he translated for us. Rising to this occasion, Det addressed the science committee, pulling out all the stops of his eloquence, and going full steam, being translated by the native Japanese. Because Det was nothing if not considerate, he paused between the clauses, to give the translator an opportunity to get it straight. This went on for a while, when suddenly the interpreter fainted dead away. It turns out that, to translate English to Japanese, you have to hear the whole sentence first. The clauses were bad enough, but the pauses between the clauses were too much for the poor man.

Det's special originality was clearly shown in the Academy, which he really made work as an instrument. I was a little sorry he did so well with it, because I liked the Academy when it was mostly an honorific society. I explained it all to my friends by saying, "If you're an honorific society you're always in reserve. Sometime when the need becomes tremendous, the President can call upon you" — as he did, in the last war. But that wouldn't do for Det's restless spirit. As a result, the National Academy of Sciences grew into a sizeable and very active organization, providing intense competition to a number of other organizations that exist around the country, partly because of Det's intense personal relationship with the members. The same thing happened at Johns Hopkins, and even though he was there only a short time, he left an indelible imprint.

Of course, his great monument is the way he turned a specialized institute for medical research into a university strongly focused in the basic sciences. Despite all his travels around the world, Det was basically a New Yorker, so it gave him special pleasure to return to the town of his birth, and to build and expand this institution. He never spoke about it much to others, but, because I'm a New Yorker, too, we could become quite intimate about it. And as proof of my assertion, you may have noticed, if you've ever had drinks with Det, that it always was Manhattans.

Det's deeper loyalties in science, as far as I could grasp them, were something like this: I think he regarded science as infinite. Therefore, the way it is done and its setting are all-important. Style and setting are more important in the long run — and perhaps not so long run — than quantity and efficiency. Science — and I do not quote Det, but venture to assume his ideas — science

is a human activity done by people and for people. Science is an idea, not a mine that can be exhausted. It is not something to be loyal to; it is something more profound. It is the highest expression of the human spirit, to be pursued with humility and humanity, with dignity and with awe and wonder. Science is not a skill; it is not an art alone; it is a calling. This expresses, to my mind, Det Bronk's approach to his life work. And with this approach, he made a significant and beautiful life for himself, his family, his friends, his colleagues, and to the glory of the human spirit.

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