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DETLEV WULF BRONK · 1897-1975

Detlev W. Bronk, president emeritus of The Rockefeller University, died on November 17 at New York Hospital from complications following a stroke sustained the previous week. He was 78 years old.

In the course of a protean career, Dr. Bronk pioneered biophysical research in the United States, establishing a major laboratory at the University of Pennsylvania; introduced sweeping changes in the structure of undergraduate and graduate education at The Johns Hopkins University; led the National Academy of Sciences for 12 years; advised three American presidents; produced a prodigious number of scholarly writings; and had a mountain named for him. He was also the guiding force that transformed The Rockefeller Institute for Medical Research into The Rockefeller University.

Many honors came to him, among them the National Medal of Science, the nation's highest award for science, and the Presidential Medal of Freedom. Fifty-five educational institutions, here and abroad, bestowed honorary degrees on him. In 1972, Rensselaer Polytechnic Institute, of which he was chairman of the board for six years, dedicated the Detlev W. Bronk Bio-Science Laboratory in his honor. Outside his Gasser Hall office hangs a photograph of Mount Bronk, named in 1963 by the National Science Foundation's Office of Antarctic Programs. It was one of his favorite possessions.

Dr. Bronk was born in New York City on August 13, 1897, the son of a well-known Baptist clergyman and descendant of Jonas Bronck for whom the Bronx was named. He served as a Naval flyer in World War I, earned a B.A. degree from Swarthmore (1920), an M.S. in physics (1922), and a Ph.D. in physics and physiology (1926) from the University of Michigan. Appointed an instructor at Swarthmore, he rose to assistant professor, associate professor, and professor within a few years, and also served as dean of men.

Of major importance in the development of his research was the work he pursued in England, as a National Research Council Fellow. He studied heat production in muscles and nerves with A. V. Hill at the University of London. Then, with Edgar Douglas Adrian, now Baron Adrian of Cambridge, he helped to develop the technique of recording the electrical activity of single nerve fibers. Those "strenuous and exciting days," as Adrian described them, were of enormous scientific significance. Their work has been hailed as having inaugurated a new era in neuro-

continued on page 4

"That Remarkable Gift"

FREDERICK SEITZ

The shock associated with Dr. Bronk's sudden and completely unexpected death last month—in the midst of his exceedingly active life—has accentuated to all of us what a highly remarkable individual he was. One can only be astonished at the range of those whose lives were directly and significantly influenced by him. They include his scientific elders such as Lord Adrian and Newton Richards, countless contemporaries, and a wide spectrum of younger colleagues including most of our own graduate alumni whom he knew on a first name basis. His influence was never dispassionate and was always coupled with a strong desire to encourage the most distinguished and capable minds in such a way as to bring them to the fore. While his unerring instinct for laying his hands on the most highly qualified individuals, in the most pregnant fields of science or science-related affairs, has been clear on our own campus, that remarkable gift was no less apparent in the other institutions with which he worked. I know of no one else in our time who came close to matching his gift of selecting unusual scientists to deal with the most challenging problems.

During the twenty-odd years he spent in leading roles with the National Research Council, the National Science Foundation, and the National Academy of Sciences, he became one of the most influential scientists in the United States. This influence was never employed in the narrow self-serving sense with which one often associates the acquisition of power. Instead he served as a lucid, constructive spokesman for all areas of science. This coupled with his uncanny sense of the appropriate placed all of us deeply in his debt. Moreover, anyone who fell within his immediate orbit not only experienced a strongly increased sense of purpose, but inevitably felt a closer link with what might be called the destiny of science.

On retirement he expressed the hope that he would find time to write a biographical history of the evolution of science and its sociology as they developed during his active years. Alas, he loved the more dynamic challenges of life far too much to spend the endless uninterrupted hours at a desk that this would have required. But perhaps another using his files will, in his own way, carry out this productive task to the benefit of those interested in the half century of science during which Dr. Bronk played such a vital role.

My office, in addition to being a workshop with which all of you are familiar, is also something in the nature of a fish bowl or air traffic window from which I can observe the passing scene. In the months ahead, I will look longingly and in vain for the sight of that brisk and intense individual who passed so often along the walk under the sycamores—usually burdened with one or two attaché cases and frequently tarrying for a minute or so for a warm and animated conversation with a friend he chanced to meet.

"The Elements of Greatness"

DAVID ROCKEFELLER

Eulogy by David Rockefeller delivered at funeral service for Dr. Detlev Wulf Bronk, November 20, St. James Church, New York City.

Standing here in the presence of Detlev Bronk's family, friends, and colleagues, I am aware of the fact that the heart of each of us is filled with personal memories rising out of the unbelievable richness and variety of his friendships and achievements.

The elements of greatness are to be found all too rarely in our society today. Det exhibited qualities of leadership which caused him to stand out among his peers: as a scientific investigator, as an educator, as an international statesman of science. Unlike many in this day of specialization, Det had interests of universal scope, and his accomplishments were on a similar scale.

He worked first as a sports writer and power engineer before turning to physics, physiology, and biophysics. He taught in four institutions of higher learning. He filled a score of distinguished lectureships and edited several scientific journals. He carried out pioneering research in neurophysiology, even recording the internal music made by a cat's nervous system. He headed the National Research Council, the American Association for the Advancement of Science, and for an unprecedented three terms, the National Academy of Sciences. He led The Johns Hopkins University as president for five years, and The Rockefeller University for 15 years—and then through his continued presence enriched our campus with his vitality for seven more years. Beyond all this, he loved life and shared his enthusiasms with family and friends. He was a devoted husband and father, a sportsman, and an avid lover of the outdoors as mountaineer, skier, sailor, and pilot.

The background of Det's family was a deeply religious one, and the stream of the Protestant ethic, which continued to flow through him, fostered in him a sense of obligation to serve mankind. This he did in a multitude of ways, but particularly by building bridges between the scientific community and society as a whole. In pursuit of this goal, he was truly a global ambassador and was so recognized in all the principalities of science, not least here in his native city and state.

Det had unlimited energy which he applied unstintingly to the many causes he served. Countless institutions are stronger and better today because of Det's creative impact. Back of him in all these endeavors was his loyal and supportive wife, Helen, a constant source of encouragement and strength for more than 50 years.

The Rockefeller University was the last institution on which Det concentrated his full-time energies. The constructive impact of his leadership will be felt there for decades to come. Det's first connection with The Rockefeller was with its board of scientific directors, which he joined in 1946. Upon the retirement of my father as president of the trustees and the retirement of Dr. Gasser as director, Det led a committee to review the future of The Rockefeller Institute for Medical Research. His insights were so keen and his vision of the future so creative that the trustees persuaded him to leave Johns Hopkins in order to implement his ideas for The Rockefeller.

I had the rare privilege of serving with him on the board during his term as president. Out of this relationship grew a warm and lasting friendship. Despite the fact that he continued simultaneous involvement in many other institutions, Det was the unquestioned architect and leader in the transformation of the Institute to the University. He personally played a decisive role in selecting a small and truly outstanding group of graduate students from whose ranks two Nobel laureates have already emerged. Thanks to Det's unfailing insistence on quality and excellence, The Rockefeller has maintained a unique position among the world's institutions of research and advanced study.

But in this hour of grief and leavetaking, I would like to go beyond the mere details of a remarkably fruitful life. I would like to try to portray the qualities of the vibrant person who reached out and touched so many other lives. And I know of no better way to do that than to evoke other voices—first, one of the many which were raised in praise of him over the years, and, finally, the voice of Det himself declaring his own faith and the vision that motivated him.

In July 1960, Queen Elizabeth, the Queen Mother, as Chancellor of the University of London, conferred six honorary degrees in science at a ceremony in Festival Hall. This occasion was part of the celebrations marking the tercentenary of the founding of the Royal Society. In presenting Det for his degree, Professor J. R. Sutherland said:

> "The world of science has now become so fragmented into so many specialized fields that it grows increasingly difficult for any one man to 'grasp this sorry scheme of things entire.' What has particularly marked Detlev Bronk out among the men of his day is his determination in an age of specialized studies to uphold the essential unity of all knowledge."

So also speaks the world. But the best of men are revealed best in their own words. Among his many other skills, Det had the verbal precision of a gifted scientist and the eloquence of a statesman.

First, then, a single sentence that catches the whole man immersed in life. Asked once how he accomplished as much work as he did, Det replied: "I don't work at all; I only do the things I like to do!"

It is revealing of his character that the other words of his I have chosen to read were written relatively early in his career. But they sound as though he had written them this week. They are the concluding paragraph of an essay entitled "The Social Obligations of the Scholar," published in January 1935. He wrote:

> "The scholar has given much to society: longer life and less suffering; more power over nature and less toil; a more accessible world. But these alone do not make a rich life. The true standard of living is not measured alone by material possessions, or health, or facilities for travel and communication. It is largely dependent upon wisdom, understanding, and freedom. This is our heritage from the scholars of the past; it is our duty to preserve it for the civilization of tomorrow."

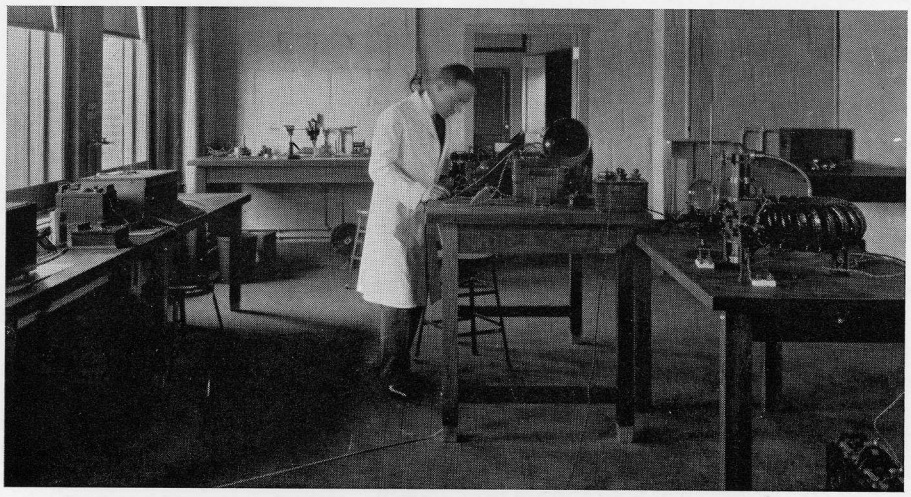
Det enlisted early in the defense of the civilization of today and tomorrow. He fought for it to his last day. His life will serve as an inspiration to all of us who were fortunate enough to have known him. May we, each in our own way, carry on the noble goals he pursued.

"Those Early Years with Detlev Bronk"

H. KEFFER HARTLINE

Professor H. Keffer Hartline was Detlev Bronk's friend, scientific colleague, and sailing mate for 50 years. They worked together at four different institutions. In 1972 Dr. Hartline became the University's first Detlev W. Bronk Professor. Following is a brief memorial to Dr. Bronk, written by Dr. Hartline, which he has titled "Those Early Years with Detlev Bronk."

I first met Det Bronk at Woods Hole in the mid 1920s. I had heard that he was attempting to measure the changes in electrical impedance of nerve during activity—a project much ahead of its time. Now it stands at the center of the biophysics of excitable tissue. Det once asked to borrow my string galvanometer to demonstrate the discharges from the electric organ of the torpedo ray. Those fish are formidable, and pack a mean wallop. I had misgivings—the delicate strings of Einthoven's galvanometer were not easy to replace. But my reluctance vanished when I learned that Det was really a physicist in physiologist's clothing. Once that summer I took him sailing on Calvin Bridge's Herreshoff sloop, and learned that Det was also a sucker for sailboats.



Dr. Bronk in his laboratory at the University of Pennsylvania, around 1930.

Det vanished from Woods Hole for a few years while he was in England with A. V. Hill and with Adrian. His work with Adrian recording the electrical activity in single nerve fibers is renowned.

Det returned from England to become the director of the newly established Eldridge Reeves Johnson Foundation for Medical Physics at the University of Pennsylvania. Physiology, from its beginnings, has been strongly "biophysical"; the Johnson Foundation was one of the first formal departments of biophysics in this country. Bronk, with degrees in both physics and physiology, was a natural choice to head it.

From the start the Johnson Foundation was a lively place. Det immediately attracted colleagues of kindred spirit, from here and abroad, with divergent interests, all of us dependent on the physical sciences for our biological researches. Det himself was a superb experimenter, his researches, with many able associates, lie at the foundations of modern respiratory and circulatory physiology. His papers are models of clarity. He prided himself on his skill in writing and developed and exercised these skills throughout his life.

In the Johnson Foundation each of us felt free to follow his own scientific bent. But Det's leadership was unmistakable. He built the laboratory and set its tone. He was a creative thinker, a vigorous doer. He enjoyed stimulating others to think, he loved to work with them. The intellectual interplay with his associates was as among peers, the benefits were mutual. He would not have had it otherwise. Det was forging the ideas and attitudes that were to guide him through the rest of his career.

The Johnson Foundation was more than a science workshop. In the lab, there were moments of noisy horseplay; a lunch table attracted many of our clinician friends; ideas, serious or frivolous, were stirred up. Then there was that none-too-elegant beer parlor, open conveniently late. Best of all were the many Sunday evenings with Det and Helen in the gracious home they built at Sycamore Mills near Media. There the incomparable Bronk hospitality generated lively conversations, much shoptalk, new perspectives, warm friendships. (Did I mention the good food?)

There was also sailing. I sailed with Det frequently in those early years. He was devoted to sailing, even more than to skiing. He was a competent yachtsman, although sailing with him had its moments. As when he anchored off the ferry slip in Port Jefferson. Helen and I protested, but Det was captain. Early the next morning, the ferry came in. The language from her bridge was colorful.

The war and subsequent years changed things. Det had less and less time for the laboratory as his responsibilities increased and his scientific interests and associations broadened. He became more and more a "statesman of science," with critical roles in the National Academy of Sciences and the National Science Foundation. In 1949 he became president of Johns Hopkins University. The founding of the Thomas C. Jenkins Laboratory of Biophysics, with many of us from the Johnson Foundation in it, was one of his accomplishments at Hopkins. He worked to level the barriers between undergraduate and graduate education. He was a staunch defender of academic freedom in those trying times.

In 1953 Det was appointed president of what is now our Rockefeller University and here he was able to fulfill his driving ambition to found a graduate university. The great success of this last phase of his remarkable career had its roots in "those early years."

"A Stimulating Mentor"

FRANK BRINK

Like Dr. Hartline, Professor Frank Brink was associated with Dr. Bronk for most of his professional life, as a graduate student at the Eldridge Reeves Johnson Foundation, in the Air Surgeon's office during World War II, and later at Johns Hopkins. In 1953, when Dr. Bronk became president of Rockefeller, Dr. Hartline and Dr. Brink were invited to join its faculty. Dr. Brink was Dr. Bronk's choice for dean of graduate studies, in which post he served from its establishment in 1957 until 1972. In 1974, he succeeded Dr. Hartline as Detlev W. Bronk Professor. These are his words of remembrance.

When I first met Det Bronk, 40 years ago at the Johnson Foundation for Medical Physics, he was already an established scientist whose research work was well known to contemporary physiologists. I soon learned that he genuinely enjoyed doing, in company with equally enthusiastic colleagues, a neat, clear-cut experiment that provided some small new understanding of the physiological mechanism under investigation. To this end no amount of effort was too much. In apprenticeship with him and Martin Larrabee, I was taught the necessity for persistence in successful research. A 12-hour experiment could be terminated at two in the morning, only to insure an early start on the next one—after a late breakfast! He vigorously denied being a perfectionist. Nevertheless, many coworkers were painfully aware of this trait when it became time to write a scientific report of the research. He was a stimulating mentor for a young graduate student who was just then developing a small degree of self-discipline.

Det had a tremendous capacity for friendship with all kinds of people. As a graduate student I was treated as a colleague and, on many Sunday evenings, was invited to his home as a friend. Many

continued on page 4

continued from page 1

physiology. Professor H. Keffer Hartline, a lifelong colleague, credits the work of Adrian and Bronk with having inspired him to apply comparable methods in his own research with the optic nerve, for which he was to receive a Nobel Prize.

Returning to the United States in 1929, Dr. Bronk was appointed a professor at the University of Pennsylvania where he organized and, for 20 years, directed the Eldridge Reeves Johnson Foundation for Research in Medical Physics. There he pursued his method of unitary analysis of nerve function and helped to lay the foundation for modern studies of cardiovascular control in mammals. A related research interest was concerned with the rate of delivery to the brain of oxygen and its utilization by nerve cells. He also directed the university's Institute of Neurology.

Dr. Bronk was elected president of The Johns Hopkins University in 1949; and, in 1951, he announced the Hopkins Plan, a program he designed to erase the arbitrary barriers between undergraduate and graduate study. He wanted students to be able to progress at their own pace.

Around this time, The Rockefeller Institute for Medical Research was reaching its half-century mark. For 50 years, the Institute had led the nation in its field; its influence was apparent in every medical school and science center in the country. The Institute's pioneering mission achieved, the board of directors felt the time had come to look in new directions. They asked Dr. Bronk, a member of the board since 1946, to head a committee to consider the Institute's future and also to suggest candidates to succeed Herbert Gasser, who was retiring as director. The committee's recommendations laid the groundwork for The Rockefeller University, a unique experiment in interdisciplinary advanced education. The obvious choice to head this bold endeavor, his fellow committee members quickly concluded, was Detlev Bronk.

In 1953, Dr. Bronk became the first president of the new graduate university. During the 15 years of his leadership, the faculty was tripled. The Institute's original emphasis on the life sciences and biomedical research was strengthened and enlarged, and distinguished faculties in physics, mathematics, ethology, physiological psychology, and philosophy were added. New buildings were erected to accommodate growing needs—Caspary Hall and Auditorium, Abby Aldrich Rockefeller Hall, the Graduate Students Residence, Sophie Fricke Hall, Gasser Hall, and the South Laboratory. The grounds were made extraordinarily beautiful. The Tower Building was planned. Most important, the Ph.D. program, which graduated its first class in 1959, proved as successful as Dr. Bronk had predicted. The laboratory-based student-as-colleague approach, so dear to his heart, has continuously produced alumni who have had an enormous impact on the scientific community.

Dr. Bronk's educational and administrative leadership extended far beyond university walls. For 30 years, he was an active participant—and frequent gadfly—in the affairs of government as they related to science and the welfare of society. During World War II, the former Navy flyer was coordinator of research for the Air Surgeon's Office of the U.S. Army Air Forces and received an award for exceptional civilian service. In this role, he also implemented studies related to the physiological maintenance of pilots during high altitude flying, recruiting teams of physiologists for such investigations and for the training and testing of pilots subjected to low concentrations of oxygen. This work was a direct application and extension of his previous research at the Johnson Foundation.

Following the war he was chairman of the National Research Council and as president of the National Academy of Sciences from 1950 to 1962—an unprecedented three terms—was responsible for expanding the role of the academy and council as a major force in facilitating the flow of scientific advice from the scientists of the country to the various agencies of the federal government, in accordance with the original purposes of the academy.

In 1952, he served as president of the American Association for the Advancement of Science, the largest scientific organization in the country. He was instrumental in the development of the National Science Foundation. He served as a member for 14 years and as chairman from 1956 to 1964 of the National Science Board. In this role he worked to expand federal support of basic research in universities. He was a member of the President's Science Advisory Committee and chairman of its Panel on International Science, from 1957 to 1963, and consultant-at-large until the committee's demise in 1963. He was a member and, from 1968, chairman of the New York State Science and Technology Foundation.

Dr. Bronk became president emeritus of the University in 1968 but, until illness struck last month, he remained a vital and active elder statesman on this campus and a worldwide lecturer, adviser, committee worker, and scholar of science. Two of his articles, one on the history of the National Science Foundation and the other on the Marine Biological Laboratory at Woods Hole, appeared this year in *Science*. At the time of his death, he was preparing a similar historical account of the Woods Hole Oceanographic Institute.

In 1972, The Rockefeller University made formal its debt to this singular man with the creation of the Detlev W. Bronk Professorship, the first named chair in the institution's history.

Dr. Bronk is survived by his wife, Helen; three sons, John Everton Ramsey, chairman of the department of biochemistry of York University in England; Adrian, teacher of English at the Loomis School in Connecticut; and Mitchell Herbert, head of the science department of the Milton Academy in Massachusetts; and four grandchildren. Dr. Bronk was buried in Woods Hole, Massachusetts, where he and Mrs. Bronk maintained a summer home.

continued from page 3

years later, several hundred graduate students at The Rockefeller University experienced this same friendly interest, the same generous hospitality, and the same personal concern for their welfare. In all of his activities—experiments, writing scientific papers, creating a graduate university or a national foundation for science—he took the lead in resolving problems through friendly persuasion of the people concerned. He talked and wrote about a scientific institution in terms of the persons involved in its creation and its perpetuation. He was convinced that successful cooperative effort in any enterprise must be based upon friendships among like-minded, thoughtful people, be they young students or peers.

One of Det's firm convictions was the belief that creative people do well only those things they strongly want to do. Ergo, a graduate university should provide merely the opportunity for self-development to the competent student engaged in advanced study and research, including the privilege of choosing from among the faculty of senior scientists his particular mentor. This was such a novel idea to some of our new students that I, as dean, had to persuade them that it was so, much to Det's amusement. He was, above all, a generous man who constantly tried to insure that young scholars would have opportunities commensurate with those he had carved out for himself by his tremendous capacity for doing many things well.

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