
Frank A. Geldard: 1904-1984



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Frank Arthur Geldard was born in Worcester, Massachusetts, on May 20, 1904, to Arthur and Margaret Gordon Geldard. He was the youngest of four brothers, of whom only two survived infancy. Educated in the Worcester public schools, he entered Clark University in 1921. He majored in chemistry as an undergraduate, but changed to psychology for graduate study in the newly revived department under Carl Murchison. When he took his PhD in 1928, he had completed studies with E. C. Sanford, Kimball Young, Murchison, Paul Nafe, Walter Hunter, and Wolfgang Köhler; he had been a reader for G. Stanley Hall, and a research assistant for Joseph Jastrow. He had shared the stresses and joys of graduate life with Wayne Dennis,

Robert Leeper, and Clarence Graham. In this period as throughout his life, Geldard perceived no single force impelling him toward a special goal. In his own words from his delightful autobiography: "Coming into the world near the beginning of the century, living through two world wars with their attendant dislocations, witnessing sweeping social and political changes, and experiencing radical technological alterations of the environment, there appears never to have existed a sole immutable influence that would impart a smooth and unmistakable trajectory to my existence" (*A History of Psychology in Autobiography*, Vol. VII. San Francisco: Freeman, 1980).

Frank A. Geldard: The Virginia Years, 1928–1962

Frank Geldard's 34-year tenure at the University of Virginia was marked by great contrasts and changes in the world and in science. Through it all, from boom to bust, from the dislocations of World War II to peace, and finally to unprecedented growth in higher education and bewildering diversity in psychology, his impact upon the profession, ranging from the local to the international level, was immeasurable. Varied it was, and characterized by unflinching graciousness in his personal associations and felicity of expression in his formal communications. The central theme of his career was unmistakable from the beginning—unswerving dedication to psychology as an empirical science.

When the new PhD from Clark University arrived in Charlottesville in 1928, he found psychology there in a condition that could most charitably be described as an identity crisis. Although some sort of undergraduate instruction in psychology had been offered for more than a half-century, his appointment was the first in the University's history to be solely in psychology, without a primary base in philosophy or education. Geldard's immediate objective was to gain the unequivocal institutional autonomy of his discipline, and to secure it firmly within the domain of experimental science. The initial step was to establish a laboratory, and this he accomplished during the first year. His dissertation research having been in vision, it is not unexpected that the central thrust was in the sensory area, as it would continue to be to the end of his life. His enthusiasm and skill in the classroom generated such a favorable response among the undergraduates that he was quickly able to double the size of the staff, and shortly thereafter to win approval for a graduate program. It is a tribute to his imagination and ingenuity, as well as to his intellectual power, that a succession of outstanding doctoral students and a steady flow of significant research publications could be produced with a faculty of two and an annual laboratory budget of a few hundred dollars. Thus was laid the groundwork for three decades of departmental growth within the tradition of experimental psychology.

Frank Geldard's systematic development of the psychology department was interrupted by a four-year stint in the Army Air Corps. The Great Depression had not only brought the growth of higher education to a virtual

standstill, but was threatening to send the nascent applied psychology of World War I and the following decade into oblivion. The mission of the Flying Training Command, Office of the Surgeon General, involved the selection and training of a half-million aircrew personnel. As Chief of the Psychology Section, Major Geldard joined with other academics from across the country to demonstrate that psychology could no longer be confined to the university laboratory and classroom. The success of such projects as the Aviation Psychology Program accounted for the unprecedented public acceptance of applied psychology in the postwar era. Professor Geldard was convinced that the experience also provided a strong argument that support of training and research in the basic areas is essential for continued sound advances in practical directions.

After a postwar tour of duty in the Far East for a few months, to study the aviation psychology methods of the Japanese and to help launch the psychology unit of the fledgling Philippine Air Force, Geldard was demobilized as Colonel in 1946, with the Legion of Merit and the Department of War Commendation Medal. Returning to Virginia, he found that the University was not only deluged by the flood of veterans making use of the GI bill, but was in the early stages of metamorphosis from a small quasi-private institution to a more truly public one. For a year or two he devoted most of his attention to departmental matters, slowly enlarging the staff and budget to cope with the burgeoning interest in psychology, coaxing the administration to authorize some improvement of research space, and gradually reactivating his own laboratory. In 1948 he contracted with the Office of Naval Research (ONR) to carry out studies of cutaneous vibratory sensitivity. This project continued without substantial interruption (under the sponsorship of various federal agencies) for more than three-and-a-half decades.

Whether or not he anticipated that his resumption of academic life would be free of more global responsibilities, such a circumstance was impossible. If psychology, basic and applied, was to flourish honestly and healthily in the evolving national structure of science, leadership of the highest caliber must be recruited. Inevitably, Frank Geldard was called upon, early and often. It seemed at times that he had become a regular commuter to Washington, in connection with such appointments as chairman of the ONR Panel on Psychophysiology, chairman of the Human Resources Committee of the Research and Development Board, chairman of the Advisory Committee on Psychophysiology to the Surgeon General, as well as with membership on the Committee on Biological and Medical Sciences of the National Science Foundation (NSF) and on the National Research Council Committee on Aviation Psychology. In the first of two extended leaves from Charlottesville, 1949-50, he was to serve as research chief of the Human Resources Division, Research and Development Directorate, U.S. Air Force. The second leave, from June 1956 to September 1957, was what he regarded as his most fruitful assignment, as scientific liaison officer in the ONR, London Branch. In that capacity he visited many laboratories in Great Britain and on the

Continent, strengthening scientific ties already established by his predecessors and opening new lines of communication. On such a sound base he successfully organized the First International Symposium on Military Psychology, convened in Brussels in the spring of 1958. These activities led quite naturally in 1959 to his appointment as chairman of the NATO Advisory Group on Human Factors, in which capacity he served for a half-dozen years.

From the first, Frank Geldard's influence extended broadly, not only through his writing and his considerable editorial responsibilities, but also through the medium of the professional organizations with which he affiliated. He was early welcomed by the small group of psychologists in the Commonwealth of Virginia, and he and his students became regular contributors to the annual scientific sessions of the Virginia Academy. He cherished the warm personal contacts and the unique intellectual stimulation afforded by the free-ranging meetings of the Southern Society for Philosophy and Psychology, and served that venerable regional association as an officer in the mid-thirties and again after World War II. The Society of Experimental Psychologists was dear to his heart, from his first presentation at the 1940 gathering to his last at Charlottesville in 1982—both on tactile phenomena. He joined the American Psychological Association (APA) in 1929, and after its amalgamation with the American Association for Applied Psychology, the melding of the applied and basic orientations was personified by his election to the presidencies of the Division of Military Psychology and the Division of Experimental Psychology. It was during his term in the latter office that the almost paranoid discontent of some experimentalists was escalating to the point of secession threats, and conciliation efforts were high on his agenda. Although he consented to be co-opted by the group that ultimately founded the Psychonomic Society, it was with the clear understanding that experimental psychology must continue to be vigorously represented within the Association. In view of the scope of his scientific expertise and the range of his professional contacts, it was appropriate that he be appointed as the representative of the APA to the Division of Psychology and Anthropology of the National Research Council and to the American Association for the Advancement of Science (of which he became a vice-president), and that he play an active role in the latter association's Committee on International Relations.

Meanwhile, the emphasis on the home front was on selectivity. Through a combination of circumstances, the University of Virginia was able to avoid the headlong growth and hectic proliferation of specialties that characterized many state universities in the 1950s. Admissions standards remained high, for both undergraduate and graduate students, and an impressive proportion of both psychology majors and doctoral students of that era were to go on to distinguished careers. Faculty recruitment was governed by the principle that excellence of a doctoral program in a relatively small department can be achieved only if diversity is kept within reasonable bounds. Hence, at the close of the fifties, with a faculty of eight, research and graduate training

remained exclusively experimental/physiological in focus. Frank Geldard's guiding philosophy continued to be that "Big Budget" is no substitute for competence, and that instruction through personal involvement is preferable to the operation of a research factory.

Frank Geldard had previously resisted many attempts to lure him from teaching and research into major administrative roles, such as the presidency of his alma mater. But the request, in 1960, to undertake the deanship of the Graduate School of Arts and Sciences seemed to be offering less a diversion than the culmination of his long dedication to excellence at the University of Virginia. The Jeffersonian tradition of departmental autonomy and virtual absence of central direction, serving well in the nineteenth century, had lingered too long; lack of effective leadership had reduced the Graduate School to a minor appendage rather than the intellectual heart and soul of the whole University. The need was critical, the challenge great. Besides, the department appeared to be solidly on course, he would still be within walking distance of his thriving laboratory, and the long-awaited Life Sciences Building was finally on the architect's drawing board. And so the penultimate career adjustment was made, and the last of Frank Geldard's many contributions to the University of Virginia began.

Frank W. Finger, *University of Virginia*

Frank A. Geldard: The Princeton Years, 1962–1984

By the time Frank Geldard decided to move to Princeton University, he had reached the zenith of his powers and productivity in nearly all areas of his professional life. He had just completed a textbook in introductory psychology (*Fundamentals of Psychology*, New York: Wiley, 1962), he had completed a successful period as Dean of the Graduate School of the University of Virginia, he was still an active member of the NATO Advisory Group on Human Factors, and he was taking the highly regarded Stuart Professorship of Psychology at Princeton. In the area of research, Geldard was moving a substantial portion of his cutaneous research project from the University of Virginia to Princeton, in the process applying for a research grant that would be funded jointly by NSF and the National Institutes of Health (NIH) in its early years.

The Cutaneous Project was the center of Frank Geldard's intellectual universe; it was his child, his toy, his obsession, and the joy of his retirement years. The seed of the enterprise had been sown in the 1930s, when Geldard and his students were examining in touch and hearing some of the functional analogs of visual fusion frequency measurements. There had been some exceptionally bad studies done in the late 1920s, and the Virginia group set out to correct the record. This early series of studies culminated in the 1940 monograph by Geldard in the *Journal of General Psychology* (Vol. 22) titled "The Perception of Mechanical Vibration." With the coming of World War II, research on vibratory sensitivity was halted, and as was mentioned earlier, it was not until 1948 that a renewed effort was begun. At that time, at the

urging of his colleagues on the ONR Psychophysiology Panel, Geldard proposed a modest program of research on the subject of vibratory sensitivity, and the University of Virginia was awarded a contract by the ONR. With the help of another faculty member and two graduate students, Geldard set up a systematic program of research on the skin senses that continued at Virginia for the next 14 years. This unique enterprise resulted in the granting of at least eight PhD degrees and the publication of a number of classic papers, among which is Geldard's presidential address (in 1956) to Division 3 of the APA, "Adventures in Tactile Literacy." The Princeton Cutaneous Research Project, as it later came to be known, was a very healthy and self-sufficient animal when it arrived in Princeton in the fall of 1962 to take up quarters (by the next fall) in the remodeled engineering building. This was, of course, in the best hermit crab tradition of psychology laboratories everywhere.

It was Frank Geldard's intention to teach and do research at Princeton, and not to get involved in administrative affairs or be distracted by demands from outside agencies. Nevertheless, he served for three years as departmental representative to the graduate school, and is fondly remembered by now-mature psychologists for his sincere interest and wise counsel. In addition to his continuing service on the NATO committee, which included editing two books that emerged from international conferences, Geldard served on the NIH Sensory Diseases Panel as well as on the NSF Advisory Committee and one or two committees for the National Academy of Sciences. His teaching duties included the introductory course, in which he used his own text, noting ruefully after a semester that absenteeism in such courses results when your best lecture anecdotes are in the text. It is the one thing the sophomore learns in a single trial!

The graduate course work during the 10-year period of his active tenure at Princeton consisted of a seminar in history and systems, for which the content varied cyclically over a three-year period, and a seminar in sensory psychophysiology, which also changed in content periodically to include each of the various sensory systems. When in 1974 Frank Geldard was given the American Psychological Foundation Distinguished Teaching award, it was as much in recognition of his superb abilities in directing graduate research and his authorship of *The Human Senses* (New York: Wiley, 1953; rev. ed. 1972) as it was of his day-to-day teaching skills in the classroom.

The course to which Frank Geldard gave much of his attention was an advanced undergraduate course in perception, which included a laboratory that required the students to work on a problem that had not been studied previously, or at least to extend one that had been studied. It was this course and the students' reactions to it that gave Frank Geldard so much pleasure during his time at Princeton, not least because his graduate students and staff associates became involved in it as well. The swirl of ideas and speculations during the progress of the laboratory work was a powerful stimulant to everyone involved, and the interaction at critical junctures of the research

was often as intense an intellectual experience as the young undergraduates had ever had.

It was somehow fitting, therefore, that in his last course in perception before his retirement, while the students were attempting to reexamine and extend the Helson “Tau” effect, there took place a serendipitous event that would determine the course of the rest of Frank Geldard’s research life. It is unnecessary to say that Frank himself was acting as observer in the experiment—he insisted on this in any study in which he had any part—when an inappropriate stimulus pattern was activated, resulting in the generation of an illusion of a continuous hopping sensation along the arm over a distance of 15 cm. He reported later that nothing like this had ever occurred before, and he demanded a repetition. The illusion proved to be quite stable, and was subsequently observed by nearly the entire course membership, including the instructors. Within a few days of the original event, Frank Geldard had begun a new research notebook first called “The Rabbit,” and later “Saltation.”

The initial series of studies examined the illusion generated by multiple taps occurring at two or three sites on the skin separated by 10 to 15 cm. As sophistication grew, the stimulus pattern was reduced to one or two taps at one site followed at intervals of 20 to 250 ms by a tap at a second site. When the time interval was placed under control of the observer, he could “tune” the apparent position of the first tap to any point between the first and second sites by adjusting the timing sequence.

Whether Frank Geldard believed in the unity of the senses, or only in the communalities of function among them, he never failed to examine all phenomena in as many of the senses as he could, and the saltation effect was no exception. His first choice for the analog was vision, probably because it was his first love in graduate study, but practically because he felt that a spatial illusion like saltation was better studied with the most precise of the spatial senses, while some students also examined the phenomenon in auditory space. After three years of study, Geldard prepared and gave the McEachran Lectures at the University of Alberta in Edmonton. These were later published as a small book, *Sensory Saltation: Metastability in the Perceptual World*, (Hillsdale, NJ: Erlbaum, 1975). In the course of this work, mention was made in passing of a secondary effect in visual saltation: a tendency for the visual “phantom” to drift over short periods of time from one locus to another in the visual field. The effect was quite noticeable and reproducible, and was influenced by a number of variables that Geldard was just beginning to enumerate and measure in the summer of 1984, after having set the problem aside for some time.

In July of 1984 he presented the clinical symptoms of a painless jaundice, and following a long series of diagnostic studies and surgery, it was concluded that he had a malignant and inoperable tumor of the liver. Frank Geldard ignored the implications of this analysis, and continued to plan a survey of the work of the Princeton Cutaneous Research Project over the 22-year period of its existence, as well as to consider the next steps in the investigation

of saltatory drift in vision. Closure on these projects was not to be; Frank Geldard died on December 8, 1984, in his eightieth year, and became a part of the history of psychology, a subject matter that he loved and served well. His professional life began with encounters with the likes of E. B. Titchener, G. Stanley Hall, and Wolfgang Köhler, and he shared his maturing years with men like J. J. Gibson, S. S. Stevens, Clarence Graham, and A. W. Melton. He often acknowledged his intellectual debts to these and others of similar stature, and insisted that no student be allowed to support a Geldardian (or any other -ian) belief without first proceeding through the chain of reasoning that begot it. This uncommon trait distinguishes him from many of his peers, who worshipped a theory or a technique, sometimes to the point of irrationality. Frank Geldard had only one "ism" in his life—empiricism, and it existed only to adduce the facts of sensory psychology, which was the object of his lifelong dedication.

Carl E. Sherrick, *Princeton University*