

Carroll L. Shartle

AUTOBIOGRAPHY

I was born at Ruthven, Iowa, 26 June 1903. The homeopathic physician who performed the home delivery charged ten dollars and my weight was nine pounds. My mother was 33 and my father 41. I was the only child and had early exposure to adult standards of behavior.

My mother as a child came to Iowa from Wisconsin via Kansas in a covered wagon. She had been a school teacher beginning at age 17 after a brief normal school training at Mason City. My father was a Hoosier. He had little formal education and in addition to farming had an auction business. He was called "Colonel" and his loud voice, it was said, could be heard over a mile away. As a small child, he came with his parents from Indiana, changing trains in Chicago, while the ruins were still smoking following the great fire.

The Shartles were Huguenots who had come from Bavaria via a stay in Switzerland. They founded the town of Shartlesville, Pennsylvania, and fought in the Revolution.

I enjoyed being an only child on a farm largely in terms of the fringe benefits. I had my own horse from the time I was six years of age and a shotgun at ten for hunting squirrels, rabbits, and ducks. I trapped muskrats and mink in the winter and went fishing and swimming whenever I could in the warmer months. I liked to tinker with machines and build things in the farm shop. I kept the number of playmates to a minimum--one or two was plenty for any given time. I was protective of my possessions and had limited interests in sharing with other kids.

Farm life was an education one could not obtain elsewhere. One learned first-hand the social and individual behavior of farm animals. To witness, for example, the sex act performed by two Percheron draft horses was a sight for a small boy to behold. One also had valuable direct experience with man-machine, man-animal, and man-animal machine systems.

Though living on a farm was enjoyable, working under the hot sun in the fields was not, and neither was doing chores morning and night, particularly in the winter. I envied the town kids who had not cows to milk or a barn to clean before and after school. I decided agriculture was not for me.

I was required to attend Methodist Sunday school and later church. I did not like it and also resented being denied fishing or hunting on Sunday afternoons. I envied Catholic kids who had no such restrictions. Later on I read a book that described the various religions of the world quite objectively. The miracles and myths were taken care of. It was a great relief to me.

In my high school class there were twenty graduates; only six of them were boys. In those days many boys dropped out after the eighth grade to work on the family farm. Three boys went to college and we all earned doctoral degrees.

I was admitted in 1922 to Electrical Engineering at Iowa State College (now Iowa State University) at Ames. I enjoyed engineering, particularly in math, physics, chemistry, and shop courses. However, in the E. E. orientation course the description of probable jobs was not appealing. Electrical Engineering looked like a desk job with a slide rule day after day. There were very few electives, but I violated the curriculum by taking too many of them, including psychology.

The elementary psychology course, using Woodworth's text and several experiments performed by the students, was an eye opener. The course was taught by Thomas Vance, who had received his Ph.D. at the University of Iowa in 1913. I took more psychology, including personnel psychology taught by the Head of the Department, John E. Evans, who had received his Ph.D. at Columbia in 1916. Evans was not an inspiring teacher, but the content he presented impressed me greatly. He had been a psychologist in the Army in World War I and brought many examples from that era.

Another elective I took was in Vocational Training and in this course I was exposed in detail to job analysis as a method for determining task content. This made a lot of sense and I never lost my conviction that job analysis was a basic technique, not only for training but for almost every other personnel function including employee selection, accident prevention, salary determination, personnel transfer, and job re-engineering.

I wanted to major in psychology at Iowa State but it was prohibited because of an agreement with other state institutions--all of this has been changed now. The Dean of Engineering scolded me for too many violations of the engineering curriculum and, to make a long story short, I transferred to Iowa State Teachers College (now University of Northern Iowa) and majored in psychology. I received good training under E. O. Finkenbinder, who had taken his Ph.D. under G. Stanley Hall at Clark - one of the great names in psychology, first president of APA.

My initial experiment (using students) was attempting to measure the effect of caffeine on mental performance. Caffeine and sugar pills were supplied by the campus physician. The experiment was quite well controlled, but the results were inconclusive.

I did my practice teaching in mathematics. No Iowa school was interested in employing a psychology major at that time so I decided to make a pitch for industry. My class in electrical engineering was already out a year. I wrote to a member, a fraternity brother who had taken a job with the Milwaukee Electrical Railway and Light Company. Much to my surprise, he replied that his company was looking for a young psychologist to work under direction of Dr. Sadie M. Shellow. He suggested I write her a nice letter of application. I did, and landed the job.

My qualifications looked good on paper with a background in both engineering and psychology and work experience as a farm laborer and for one summer a millwright laborer in a packing house (I had worked in Omaha one summer for Swift & Company).

Little did I know that I had secured the only position in industrial psychology that was open anywhere in the country that spring. Morris Viteles had originally set up the program at Milwaukee. It was one of the most outstanding examples of successful industrial psychology that anyone knew about.

Mrs. Shellow (although she was not referred to as doctor) had her Ph.D. from Columbia. She was an excellent teacher and supervisor.

My principal duty at first was selecting motormen and bus operators for the company, using the Viteles motormen selection test plus a clinical type interview and a practical written test. Later on I made validation studies of tests for electrical troublemen, substation operators, trade apprentices, and other.

When I first reported for work, the Superintendent of Transportation told me that farmer boys made the best motormen. I later checked the personnel records of 1500 cases and discovered that more farm boys were discharged for accidents than any other occupational group.

I prepared a job analysis and took the training course for street car motormen. It did indeed provide a realistic feel for the job. In these days, it cost \$500 to train a motorman and if he failed to qualify, the money was wasted. We obtained convincing evidence (using a control group) that motormen failures were reduced by using the tests. In fact, 16% of those who were hired without use of the tests were discharged because of serious accidents, whereas less than one percent of the tested group were discharged. After this was reported, the company became "over-sold" on selection testing and it was occasionally necessary to show, after making a job analysis, that adding tests would not reduce turnover but rather, improvement in working conditions or bringing the wage rate up to community standards would be helpful.

I developed my own job analysis schedule. It was patterned after the example in Bingham and Freyds' 1926 book, *Procedures in Employment Psychology*. I would spend at least a week working on a given job. In studying meter readers, for example, I learned by experience the main trouble - the bottoms of my feet almost gave out. This resulted in the medical department giving closer attention to foot examinations and seeing that shoes fitted properly.

In 1927 I was fortunate in another way. The company sent Mrs. Shellow and I to the APA annual meeting in December at the Ohio State University in Columbus. This was the real eye opener. Walter V. Bingham described his work at the Boston Elevated Railway in reducing accidents and reported on his recent visit to England. H. L. Hollinworth was that year's APA president. His address was on redintegration. I later took his course on this topic at Columbia.

On the fourth floor of Arps Hall there was an exhibit of apparatus. A man with a black mustache showed me around. He turned out to be Harold Burt, who had written a recent book, *Principles of Employment Psychology*. I was very favorably impressed and six years later I completed my Ph.D. dissertation under his direction.

In the spring of 1928, Mrs. Shellow approached me about taking graduate work at Columbia University summer school. If I was interested, the company would give me time off and help with the expense by paying my way to Boston to visit the Boston Elevated Railway. The company also had a policy of paying half tuition and supplying books for staff who took job-related college work. Naturally, I accepted and spent the next four summers at Columbia. I did my masters thesis under Henry Garrett (later APA president) who wrote a widely used text in psychological statistics.

For an M. A. thesis I submitted my validation study of electrical troublemen, using a multiple regression analysis. Henry never informed me if he finally approved the thesis, but one day, several months later, I did receive a mimeographed letter from the registrar indicating that if I sent 29 cents in stamps, my diploma would be forwarded. The results of this study were published in *Personnel Journal*.

At Columbia I had the good fortune to take work with A. T. Poffenberger, Clark L. Hull, Gardner Murphy, and Knight Dunlap, all of whom became APA presidents. Also, I had a course in social psychology with English Bagby that had a life-long effect. I met my future wife, Doris Brown, who was finishing her undergraduate work at Skidmore College. She became a social worker and later a trustee of

the college. I soon found that marrying a social worker had its advantages, as the depression threatened the financial security of psychology graduate students.

I took a course in psychopathology at the State Mental Institution at Wards Island and visited the industrial psychiatric program at R. H. Macy & Co., directed by V. N. Anderson, author of a pioneering text, *Psychiatry in Industry*.

These experiences broadened my point of view and suggested new concepts and variables to include in future studies of workers and jobs.

Following the stock market crash of 1929, business declined in Milwaukee and the company almost ceased hiring new employees. My work on selection was greatly reduced so I worked on internal problems such as upgrading and promotion, job training, and accident studies. We had an accident clinic, which was quite successful. I also taught teaching methods course in business psychology at Marquette University.

By late 1930 the depression was hitting harder. Lay-offs were frequent and there was talk of reducing staff and cutting the hours worked per week. This meant salary reduction.

It seemed like a good time to leave industry and get a Ph.D. So in June 1931, I left Milwaukee for New York to finish my masters degree. Doris and I were married in September and both became graduate students at Ohio State.

Graduate work was very exciting. I took courses with Dockeray, Goddard, Toops, Edgerton, Purtt, Renshaw, and Williams. I was lucky and passed all my examinations, including French and German, the first time around. My grades were all A's and I finished ahead of schedule.

Professor Burt earlier had arranged for me to meet executives from Ohio Bell and A. T. & T. Arrangements were made for a dissertation on psychological factors in foremanship with Ohio Bell supplying the subjects. There were two groups: (1) successful foremen and (2) non-foreman who had failed in supervisory roles or who were not considered supervisory material.

I analyzed the jobs and developed an interview schedule for determining personal and background variables that differentiated the two groups. Results were published in *Personnel Journal* and copies of the dissertation were made available to Ohio Bell and

A. T. & T. It was interesting in those days to dial the A. T. and T. number in New York and receive a nickel back.

The first year at Ohio State I was an assistant to F. C. Dockeray in a study of infant behavior. The second year I became a part-time instructor for \$2000, but in spring 1933 there was a salary cut to \$1800, and it was announced that for the coming year the salary would be \$900.

No job openings appeared and I joined two teacher placement agencies. Three openings appeared and I was fortunate to receive a one-year appointment as instructor in the Department of Philosophy and Psychology at Michigan State College (now Michigan State University). There were over 70 applicants for the position, which paid \$1800 (less a 5% fee to the Albert Teachers Agency). It was a two-man department - the Chairman, a philosopher, and me. I taught general, experimental, child, applied, industrial, and special problem courses. It was indeed a challenge. I learned a great deal and

received many complimentary text books. The college had excellent stenographic services and did all the final typing of my dissertation. Thirty-five years later I was asked to return to Michigan State and to make an evaluation of the Department of Psychology. It was indeed a pleasure to observe the excellent development and to note the indication of promise for the future.

Although my position at Michigan State had been renewed for a second year, I saw no encouraging signs for tenure.

In fall 1934, I was approached about a position in the U. S. Department of Labor. With the passage of the Wagner-Peyser Act in 1933, the U. S. Employment Service had been strengthened. A new venture called the Occupational Research Program was being established to systematically find out what the jobs were in America. With millions unemployed, how could the situation be improved without knowing jobs and their requirements in our economy? A Technical Advisory Board was established. Members were nominated by the Social Science Research Council of New York and National Research Council of the National Academy of Science. Outstanding psychologists on the Board included L. J. O'Rourke, U. S. Service Commission; Paul S. Achilles, Psychological Corporation; W. V. Brigham, Stevens Institute of Technology; Clark L. Hull, Yale University; Donald G. Paterson, University of Minnesota; A. T. Poffenberger, Columbia University; and Morris S. Viteles, University of Pennsylvania. Ismar Baruch, head of classification for U. S. Civil Service Commission, was nominated by Social Science Research Council as was J. Walter Dietz, Western Electrical Company, who was appointed Chairman of the Board.

William H. Stead, Associate Director, U. S. Employment Service, was Director of the Program. He had been Associate Professor of Economics, University of Minnesota, and Executive Secretary of the Minnesota Employment Stabilization Research Institute at Minneapolis - St. Paul. Stead's minor for his Ph. D. at Minnesota was psychology.

Marion Trabue, a psychologist on leave from the University of North Carolina, was Technical Director the first year of the O. R. P. He had also been associated with the Minnesota Employment Stabilization Research Institute. Beatrice Dvorak had also worked with the Institute, and came to Washington in 1934 in charge of administering tests at the D. C. Employment Center. Her dissertation under Paterson was on occupational ability patterns.

Harold Edgerton, on leave from Ohio State, had come to head the Statistical Unit of ORP. I had had a valuable seminar with him on Fisher's Statistical Methods. When Harold's leave was up, we tried to replace him with Robert Wherry but there was a shift in budget at that time and the Statistical Unit later became a part of the Worker Analysis Unit under Beatrice Dvorak.

Incidentally, the Director of the United States Employment Service was W. Frank Persons, formerly Assistant to the President, Milwaukee Electric Railway and Light Company. He had been Chairman of the Committee that operated our Accident Clinic.

I officially joined ORP in June 1935 as Chief Industrial Psychologist--at least that is what I thought. When I was sworn in I was amazed to find my official title was Technical Assistant at Large. I was then told that Frances Perkins, Secretary of Labor, had had trouble of some kind with a psychologist when she was Industrial Commissioner for the State of New York. It was thought good strategy to delete the word psychology from the program. I then became Chief of the Worker Analysis Unit. (No one in the entire ORP was ever referred to as "doctor.")

Years later when Miss Perkins was U. S. Civil Service Commissioner and I was on the Advisory Committee on Personnel in the Social Service of the Commission, she indicated, "of course we don't employ psychologists in the Federal government." She was astonished when someone reminded her that she had had many psychologists on her payroll in the Department of Labor. I was embarrassed, for Miss Perkins had recently autographed for me, with warm greeting, her new book, *The Roosevelt I Knew*.

ORP was supported by funds from the Laura Spelman Rockefeller Fund and later by the Carnegie Corporation and the Rockefeller Foundation through the American Youth Commission. It was necessary to have the approval of FDR for this arrangement, which fortunately he promptly gave. Frederic A. Delano, uncle of the President, was named trustee of the foundation funds for ORP and became a member of the Technical Board. This tie with the White House was a blessing. I met Mrs. Roosevelt later on at some function or other. To my surprise she knew who I was and all about the program, and was much pleased with our progress.

We had no problem with security clearances but the U. S. Employment Service at that time was not under the Civil Service System. We had an agreement, however, that all ORP appointments were to be made on a strict merit basis. Once someone forgot to type "Occupational Research Program" on the appointment form. It went into political clearance and was rejected because the applicant's father was a leading Republican. The form was later re-submitted with the proper identification and was immediately approved by the Secretary.

The foundation funds were of course temporary. As they ran out, we managed to enlarge the government budget to take care of most of the foundation personnel who wished to remain with the program.

When ORP was first established, the Technical Board, thank goodness, specified that all occupational information should be collected by the use of job analysis, and that any tests developed must be validated before being placed into use in the Employment Service. Field Research Centers were developed and WPA relief funds were obtained to cover the bulk of the lower paid workers. Job analysts with engineering degrees could be found for \$2000 per year and up, and psychologists with Ph.D's came at the same price.

Two of the first psychologists I hired were Viteles' graduate students; Jay L. Otis, who later went to Western Reserve University and became president of Division 14. The other was Luigi Petrullo, who eventually became head of the psychology program at Office of Naval Research. Roger Bellows also came early and headed the Worker Analysis Unit at the Baltimore Field Center. Clark Hull of Yale recommended one of his students, Frank Fletcher, who headed the program at our Boston Center and later went on to be director of the Counseling Center at Ohio State. Homer Bishop, a professor at Wittenberg College, became the first head of the research program at Atlanta. Richard Leukart came from Ohio State and among other posts headed our Chicago Center. He and Jay Otis, in later years, wrote a book on job evaluation, which is now a classic.

It was planned that ORP would prepare a five-foot shelf of job descriptions but soon it looked to be more of a ten-foot shelf. Furthermore, books of occupational descriptions were poorly utilized. They made good decorations for book cases in public employment offices. In one office we found them used by a secretary as something to sit on to better reach her typewriter.

The job analysis schedule we developed included a "worker characteristic form" with which a job analyst rated A, B, C, or D the amount of each of 50 characteristics required by a worker to perform his job satisfactorily.

These data were utilized in grouping occupation according to similarities called "Job Equivalents." I had difficulty explaining this concept to the House of Subcommittee of Appropriations and in doing so I used the term "families of jobs." This they understood and from then on it was a "job family" program.

We had two approaches for determining human characteristics required for success in a given occupation. One was the ratings by analysts and the other was measuring these characteristics by testing workers in the occupation. Ratings were more subjective but in the testing method on measured the workers who happened to be in the occupation at the time. Many of these might be much more satisfied and satisfactory in some other pursuit. Results of the rating and testing methods were later compared and it was found that there was sufficient over-lap so the methods complemented each other.

Our various field centers early began to help local employment offices prepare their own job information for aiding in interviewing, counseling, and placement. On the national level a shift was made to cover all occupation by developing a comprehensive Dictionary of Occupational Titles.

In the aptitude testing area we brought Beatrice Dvorak into the program from the D. C. Employment Center and placed her in charge of both test development and test utilization. We exercised great care in insisting on training interviewers and other personnel before they could utilize tests. We began with stenographic and typing tests and if these were utilized properly, training was made available in the use of oral trade tests and aptitude test batteries.

My background in industry led me to insist on validation of aptitude tests in terms of differentiating between more proficient and less proficient workers, rather than using general norms to differentiate among occupations. We ran up specific aptitude test batteries using multiple regression equations. We had access to the IBM equipment of the Bureau of Labor Statistics, which was helpful and of course we bought many calculators.

Specific aptitude test batteries began to proliferate in number, and factor analyses were made to reduce the number of different tests--this led later to the general aptitude test battery (GATB). L. L. Thurstone offered us his tests which had been described in his APA presidential address, 1933, entitled The Vectors of Mind. This was the best presidential address in APA history according to my standards. APA that year met at the University of Chicago and, of course, every one visited the World's Fair.

Frances Perkins was not the only federal official skeptical of psychology. The dominant social science discipline in the government was (and still is) economics. The Bureau of the Budget statistical committee--psychology not represented--had to approve or disapprove all questionnaires used in surveys and research. Our tests were threatened. I argued they were not questionnaires but scientific measuring devices. We won that battle, but later on, and even today, tests are often threatened by judges who know nothing about psychological measurement theory or methodology.

In 1939, Roosevelt, with the help of a high level committee, reorganized the Federal government. Many budgets were dramatically cut. ORP became the Occupational Analysis Section, with me in charge. William Stead, who had been my boss, went to Washington University, St. Louis, as Dean of the School

of Business and Public Administration. The Employment Service was moved from the Department of Labor to the Social Security Board and combined with the Bureau of Unemployment Compensation. I spent a good deal of time helping our people find other jobs. Many more were transferred to the State Employment Services and continued their work, particularly in training people in job information. We retained several of our research centers. The Dictionary of Occupational Titles was in the government printing office and came out in the summer of 1940 with 18,000 definitions and 30,000 titles. We had to help train 10,000 people to use it, and later thousands more were trained by the Army, Navy, Air Corps, and Marines.

Also in 1940 Occupational Counseling Techniques was published, covering the Worker Analysis Program. Chapter authors included Stead, Shartle, Osborne, Cooper, Otis, Dvorak, Endler, Kolbe, Bellows, and Ward. This book had a good sale, and later received many citations because Appendix V had a clear description of the Wherry-Doolittle Test Selection Method.

After World War II had broken out in Europe, we were given extra money to develop trade tests and study jobs in defense industries and in the U. S. Army. The Army had no trained staff. A Major Hershey and a Major Dahlquist came to invite me to help initiate the Army program, in which we made 10,000 analyses. Hershey and Dahlquist became generals; and General Hershey for many years was Director of Selective Service. He had formerly been a ROTC Professor at Ohio State. His Deputy was Colonel Dargusch (who also became general) and who was for many years a trustee of Ohio State University.

We hired back as many of our staff as were available and began a recruiting program which brought in 50 additional psychologists and at least that many more who had college training in personnel or related work.

The testing and research program under Beatrice Dvorak was greatly expanded. It was my idea to get fast learners into training for defense productions as soon as possible. The U. S. Office of Education made grants to states for training in occupation approved by the U. S. Employment Service. Those scoring highest on test batteries were referred directly to industry or to vocational schools.

A committee of APA under Edgar Doll urged me to prepare a list of defense occupations that could be successfully performed by the mentally deficient. I did not want to do this. Imagine persons in the country finding their occupation on such a U. S. government list! Pearl Harbor came along and saved the day - the project was promptly cancelled.

Our job information orientation paid off well during the war. First of all, there was the matter of work simplification - sorting our job elements that could make one job into two or more less skilled jobs. I estimated in a speech at APA that twenty million workers would change jobs. It drew headlines all over this country and implied that psychologists were going to do this all on their own. It was a bit embarrassing.

As the war progressed, Roosevelt created the War Manpower Commission and moved the Employment Service into it. But our Occupational Analysis Section had become larger than most Divisions so we moved to a new Bureau of Manpower Utilization in the WMC.

We became the Division of Occupational Analysis and Manning Tables. The term "manning tables" came originally from the U. S. Army. Our occupational analysts in studying a plant always found

the number of workers in each job classification. This gave the manpower picture for a given industrial operation and indicated how many workers and what skills were required to produce a product or service. In a tight market, labor had to be rationed in terms of need and likewise who best could be spared from draft to military service. Industry followed our prescribed procedures and developed manning tables for 3000 large establishments to help facilitate the orderly transfer and utilization of the work force.

We also developed a list of essential occupations classified according to DOT. As manpower became tighter, we developed a briefer list called critical occupations. There were essential occupations in which there was a national shortage and a training time of two years or more. If one were employed in the critical occupation, he was nearly always deferred from military service.

In the Federal government, we had the problem of when to identify for occupational deferment. The President, being Commander-In-Chief, went along with the critical occupation arrangement and elected-officials were exempt by law. There were thousands of U. S. governmental positions not on the critical list where the need for deferment seemed to exist. These requests required the permission of the President of the U. S. Naturally, he could not take time for this task, so a committee was appointed to do it for him. It was called the President's Committee on Occupational Deferments. There were two of us: the Chairman, who was a politician (who knew most of the cabinet members), and me, the technician, a pre-Pearl Harbor father unwanted by the draft.

Requests came to us directly from the Departments. If we turned down a Cabinet Member's recommendation, he or she could appeal to the President, in which case our committee of two went to the White House and argued the case with the Cabinet Member or representative before Judge Samuel Rosenman, the President's Legal Counsel (who also drafted many of Roosevelt's speeches). Rosenman then took the cases to the President with a recommendation. I think we won every dispute, although in one of the hearings with Jesse Jones, head of the Reconstruction Finance Corporation, I yielded on a few cases where additional information was supplied. It was fun to go the White House with DOT under my arm. No ID card or pass was required.

The U. S. Post Office was another critical problem. The Postmaster General told us to use our best judgement. All he wanted was that the mail get through. I had 30,000 cases for action in my back office. I spent several afternoons at the D. C. Post Office interviewing workers and estimating complexity of jobs, particularly the training time, and whether or not women could be utilized. We were unsuccessful at that time in getting the P. O. to utilize women as city delivery persons. To this day women are not frequently found.

Nelson A. Rockefeller, 35-year-old head of the Latin American Affairs Agency of the State Department with a young staff, came in with his requests for deferment and demanded immediate action. It was an eyeball to eyeball confrontation. When we said we'd need time to review the career, he beat his fist on the table and said he'd go directly to the President. I said, "Go ahead," knowing the President was leaving for Warm Springs that Friday evening and Rockefeller was heading for an extended trip to Latin America the following Tuesday.

In another instance, we received a request for the deferment of 50 or so laboratory assistants in the Southwestern U. S. They were working on a new kind of bomb that was going to blow the hell out of

everything. That request was granted; and it was the first I knew of the Atomic Bomb - which was several months before Harry Truman found out about it.

The Office of Strategic Services, forerunner of CIA, was also an interesting case. I had to know what each person was doing before I would act. I developed a point system to rate essentiality, job complexity, and other job characteristics relative to the war emergency. The Washington News got hold of it and it made the front page which resulted in a lot of flack. We had to appear before the House Committee on Military Affairs every 30 days. They always seemed to think we were not strict enough. On the other hand the Washington Post thought we were too strict and in an editorial advocated that our Committee should be fired. Also, at a Cabinet meeting, two Secretaries asked the President to discharge us, but FDR gave us firm support.

At the request of the War Department, in April 1940, the National Research Council approved a committee on the Classification of Military Personnel. Under the chairmanship of Walter V. Bingham, L. J. O'Rourke, Marion Richardson, and I were on it from the government along with L. L. Thurstone, University of Chicago, Henry Garrett, Columbia, and Carl Brigham of Princeton. This became quite an active committee. We met with General George Marshall, Chief of Staff, two or three times, with other top Army officials. Later, a sub-committee was appointed call the Technical Personnel, of which I was chairman. This linkage made me a key technical person between the Civilian manpower program and the Army programs.

Our job analysis procedures manual was adapted for use in the Armed Forces and likewise by many civilian plants. We tried to keep up with new jobs that were being created. Supplements to DOT were issued regularly.

In June 1935, when I first went to Washington, the 1934 APA directory showed only two psychologists working for the U. S. government in the district. L. J. O'Rourke, Director of Personnel Research, Civil Service Commission, and Joseph Rossman, a patent examiner with the U. Su. Patent Office. By 1945, there were nearly 200 psychologists listed.

In 1940, it was said that ORP was the world's largest Department of Psychology. We hired so many occupational analysts that the Civil Service Commission established a new classification just for us and held a nationally announced examination. After a year or so we ran a validation study. As I recall, the biserial correlation (pass-fail on exam) was $+0.30$ for those who worked in Washington, mostly on data processing, but zero for those who were sent to the field where the duties were more varied. Marion Richardson, a well-know psychologist who was with the Civil Service Commission at that time, thought the results were not bad. We chided him, of course, since such low validation were below our standards for the test batteries we had approved for use by the U. S. Employment Service.

Our program was not the only one that expanded. The Social Security Board under Henry Aronson set up a distinguished merit testing program for the states. Dorothy Adkins and Frederic Kuder, colleagues of Thurstone at the University of Chicago, came in. Thurstone once told me that Dorothy Adkins was the brightest woman he ever worked with. That was indeed a compliment.

Our own occupational analysis program expanded so rapidly that the number of personnel and program complications were almost beyond the comprehension of most of our superiors. Hence, I participated in hearings at the Bureau of the Budget and before the House Sub-committee on

Appropriations. There were tough sessions but I had good luck. My background in dramatics was helpful in testifying. Congress never cut my program, although I usually had to divide up our increases with other units in the agency that did receive severe cuts.

I discovered early in appearing before congressional committees that what was in the record did not necessarily agree with what was said informally. I remember an influential, economy-minded Congressman who blasted me in the formal hearing for wasting people's money, but at intermission warmly shook my hand and said I was doing a wonderful job. His formal remarks were released to the press in his home state. It was an election year.

Another development during the war was the National Poster of Scientific and Specialized Personnel. Their organization was separate from the U. S. Employment Service but was incorporated into the War Manpower Commission. Leonard Carmichael, President of Tufts University and distinguished psychologist, became the director. The roster had an occupational classification system for highly specialized placement services, much too detailed to be brought into the structure of DOT. Leonard and I had lunch together several times at the old Cosmos Club to explore the common elements between the two systems. I advised the Bureau of the Budget to keep on funding the Roster Classification.

On the other hand, the Selective Service System attempted a new occupational classification arrangement whereby a draftee would classify himself. I strongly opposed the do-it-yourself method, fortunately it was dropped shortly.

To assist in the expansion of psychology in the government, an office of Psychological Personnel was established in 1941 at the National Academy of Sciences building on Constitution Avenue. Stuart Henderson Britt of George Washington University was the first director. This office continued through the war and helped to set a pattern whereby APA moved its headquarters from Northwestern University at Evanston, Illinois, to the old AAAS building at 1515 Massachusetts Avenue with Dael Wolfle as the first Executive Secretary.

Although many APA members opposed moving the office to Washington, I strongly urged it. I could see an increasing role for government in the affairs of science and its funding. My model was the American Chemical Society with its impressive building on 16th street. Little did I expect APA to develop into the bureaucracy it is today.

Later, when I was Treasurer of APA, we had accumulated a sufficient surplus to buy, remodel, and equip a building of our own at 1333 16th Street. We had so much room that we rented space to the American Personnel and Guidance Association. Also, on Sunday's, the church across the street used our main floor for a Sunday school class (taught by Chief Justice Warren).

As early as 1936 the growth in applied psychology had asserted itself organizationally. APA was too narrow and rigid. A now independent association was formed called American Association of Applied Psychologists, with three sections: Clinical, Consulting, Educational, and Industrial and Business. Dues were \$3.00. The first program was at the University of Minnesota in 1937. I read a paper on our trade testing developments. The next year it was at Columbus, Ohio, and I presented a paper on our aptitude testing research. In 1939, AAAP met in Washington, D. C. I was chairman of the session on psychology in the public service. It was great to be free from the stuffiness of APA. Later (1946), of

course, AAAP merged into a new APA taking along its division structure, which has since proliferated beyond any expectation.

Further developments in psychology came in 1946 with the establishment of the American Board of Examiners in Professional Psychology, whereby diplomat status could be granted in Industrial Psychology, Clinical Psychology, Counseling Psychology, and other specialists. Marion Bills and I were the first board members from the Industrial area.

In fact, my involvement in APA became a bit too much. I remember at the Penn State meeting in 1950. I was the APA Treasurer, member of the Board of Directors, the Publication Board, and the Council; also President of Division 14, Chairman of a committee to find a new executive secretary, and member of the Board of Examiners of ABEPP. Later on, an article by Francis A. Young appeared in the Washington State Psychological Association News Letter indicating that Anne Anastasi and I had each served eleven years on the APA Board of Directors and gave us the titles of Queen Anne and King Carroll. Anne, who was a classmate of mine at Columbia, beat this record when she became President-elect of APA in 1971.

Upon invitation from Mitchell Dreese and Thelma Hunt, I introduced a course at George Washington University in Occupational Analysis Methods. Six years later I wrote a text, Occupational Information, based on this course. It went through a number of printings and two revisions during a thirty-year period.

In order to collate job analysis data on a nationwide basis, we had to insist on uniformity of procedure. In general, the psychologists in the program were involved in the development, processing, and utilization of job families, and trade and aptitude tests.

Some showed strong interest in job analysis as a scientific and useful personnel research tool. Edward Edleman, who had worked with Poffenberger at Columbia, did some work on methodology. Ernest Primoff showed the greatest interest in job analysis as a method particularly in validation of measures for the job elements approach. He has since continued this excellent work with the U. S. Civil Service Commission.

Vernon Banta of our St. Paul research center developed a modification of the job analysis schedule to emphasize physical requirements. It became known as physical demands analysis, by which one could estimate the physical demands required for various positions and jobs. The U. S. Civil Service Commission later adapted the approach for use in placement. The form was called Health Qualification Placement Record.

When I reentered the federal services in 1953 during the Korean War, I took a peek at what was checked on the form for my position as research director. Only one item, "near vision correctable at 13 to 16 inches," was checked as full capacity required. The examining physician had a staff assistant give me the eye examination twice to be sure I had the capacity. The requirement came out of the position analysis, indicating that I had many reports to read.

In 1944, the ORP had celebrated its tenth anniversary. The National Vocational Guidance Association devoted an entire issue in its journal to our work under the title, "Ten Years of Occupational Research."

With World War II drawing to a close, I proposed to my supervisors and to "powers that be" in the Bureau of the Budget that we should follow the U. S. Public Health Service model and create an Institute of Occupational Research as a part of the eventual Department of Health, Education, and Welfare. I made no progress, however. The U. S. Employment Service did not want an Institute and the Executive Director of the Social Security Administration at that time, blew cold the term Institute. He visualized the title as representing some kind of cheap gym outfit.

In our occupational analysis program we had trained hundreds of persons in job analysis and testing in this War Manpower Organization. Administrators received a brief course in occupational analysis. One of the brightest was one Hubert Humphrey, Deputy Manpower Director of Twin City area. Another was a former Texas school teacher named Lyndon B. Johnson. He was a Naval Officer assigned by Roosevelt to our Los Angeles manpower area.

Years later, both Humphrey and Johnson were very helpful when they were in the Senate. The last time I appeared before Senator Humphrey, he was on the Senate Appropriations Committee. He was indeed well-informed on social science research programs and talked about the importance of the work almost as much as I did. Shortly after, on a TV debate with a representative of the National Association of Manufacturers, he stated that he had reviewed the budget with a fine-toothed comb and could not find a place to cut a penny.

However, many unfortunate things happened to excellent programs at budget time. For example, the Bureau of Budget made a study of how well research and development money was being utilized. I had already made informal contacts with the Bureau and know all about the study. I learned that O'Rourke, with one of the best personnel research programs in the government, was perceived as not getting his results into the operations of the Civil Service Commission. I tipped off O'Rourke. He appreciated the information but seemed undisturbed. It was not long, however, before his unit was abolished he was assigned to the examining staff of the commission.

With the end of the war in sight we began to think about conversion to peacetime activities, and I became restless with bureaucratic life. I had had nine different homes in five and one-half years. I longed to be in the comparative quiet of academia full-time.

In our studies in occupational analysis in nearly 30,000 establishments we had never made analysis above the supervisory level. I wanted very much to spend several years studying people, job, and organizations beginning at the top. I made a few contacts and found a sympathetic interest in such a venture. It was obvious to me that such studies could be done better in a university setting than in government. Ohio State, among other institutions, was interested. Since I knew something of the organization and faculty at Ohio State, I returned there to become a professor of psychology with campus-wide duties as a research stimulator and administrator.

We established the Personnel Research Board, which was an interesting experiment in organizational behavior. At Ohio State at that time, Psychology was in the College of Education; Anthropology, Sociology, and Economics were in Commerce and Administration; Political Science in Arts and Sciences; and, of course, Industrial Engineering in Engineering. At first, the Academic Vice-President was Chairman and I was Executive Secretary. Later, I was appointed Chairman.

The Board, with representation from these colleges and the President's Office and the Graduate School, developed interdisciplinary programs in research and instruction and also strengthened the various departments involved. The dominant project was one I proposed, entitled "Leadership in a Democracy." The PRB ran on a formal basis until 1963 when the university was reorganized and Anthropology, Psychology, Sociology, and Political Science were placed in a new College of Social and Behavioral Sciences. The Behavioral Science Laboratory established by the Board became part of the dean's office of this new college.

The Ohio State leadership studies featuring "Leadership in a Democracy" developed into a large research program. Studies were conducted in business, educational, and governmental occupations - particularly the military. John Darley, then still on duty in the Navy, arranged our first grant from the Office of Naval Research. Aid was also received from the Rockefeller and Ford Foundations, and from a number of business firms and from the U. S. Air Force. Soon it was a million-dollar venture, involving faculty members Ralph Stogdill, Harold Burt, John Hemphill, Robert Wherry, Pauline Pepinsky, Andrew Halpin, Donald T. Campbell, Harold Pepinsky, Melvin Seaman (Sociology), Alvin Coons (Economics), and many others on and off campus as advisors and consultants. Numerous research papers and monographs were published. The leadership studies led to many theses and dissertations, including those of many prominent I.O. psychologists: Bernard Bass, Edwin Fleishman, Edwin Harris, C. G. Browne, Carl Rush, Mark Silber, Ralph Canter, Lorraine Eyde, William Jaynes, Ruben Shevitz, Robert Steltz, Gary Brunback, Robert Hilton, Jon Bentz, John Rizzo, and William Henler.

To help us get research going in private industry, I personally initiated exploratory studies with Nationwide Insurance. I roughed out executive work patterns and later lured colleagues and students to take over with their expertise in theory and methodology. They developed scales for describing leader and organizational behavior, which have had wide use and are currently available.

In 1956, I wrote a book based on our leadership studies entitled *Executive Performance and Leadership*, which was published in the U. S. and the United Kingdom. There was also a Spanish translation published for use in Latin America. The most complete overall coverage of the studies was included in *Handbook of Leadership*, an excellent work by Ralph N. S., published in 1974.

After pursuing the leadership studies for several years, I became interested in "why" leaders do what they do. I hypothesized it was their basic values that were important, and I initiated a series of studies in this area. My own research was concerned with organizational values as revealed by a projective approach wherein an individual described the ideal organization. Value dimensions were established by factor analysis for military, industrial, and educational organizations. Eugene Haas (Sociology) and consultants from several other disciplines cooperated on this project. Haas took over responsibility when I went on leave to return again to Washington in 1961.

Referring back to my career in government, I had the privilege to begin serving in 1946 on the newly created Human Resources Committee of the Joint Research and Development Board of the Armed Services. We planned the long-range program for the yet to be Department of Defense. I remember Vannevar Bush, Chairman of the Board, telling us that our area was a bit on the "lunatic fringe" but he thought it important nevertheless. Donald Marquis, University of Michigan, was Chairman, and Samuel Stouffer, Harvard, William Menninger, Menninger Clinic, and I made up the Committee, which had several specialized panels. Lyle Lanier, later at the University of Illinois, became

Executed Secretary. Each of the Armed Services was represented on the Committee and also the panels. I served on the Committee until 1953.

The Joint Research and Development Board after the establishment of the Department of Defense (1947) became in effect the Office, Director of Defense Research and Engineering, Office Secretary of Defense. The Human Resources Committee later became the Division of Psychology and Social Sciences.

In 1952-53 during the Korean War, I had taken leave from Ohio State to become Director of Research, Human Resources Research Institute of the U. S. Air Force. (For three years I had been active on its Advisory Committee.) Program included an officer personnel, officer education, manpower, human relations, psychological warfare, and strategic intelligence. We dispersed several million dollars in grants and contracts, the largest one a grant to the Harvard Business Research Center for a working model of Soviet society. Ohio State had a project on studies of intelligence officers and another related to leadership and organizational change in Yugoslavia. I have had an opportunity to evaluate the HRRRI programs in retrospect, and I think the Harvard project had the most far-reaching impact of any social science grants during that period.

Nine years later, for most of the Kennedy Administration, I returned once more to Washington as Chief, Psychology and Social Sciences Division, Office Secretary of Defense and U. S. Member of the Human Factors Advisory Group, Science Committee NATO, Paris. Harold Brown, a distinguished physical scientist, was then Director of the Office of Defense and Engineering. He was sympathetic to behavioral and social science research. Later he became Secretary of Defense in the Carter administration.

There had been many cutbacks during the Eisenhower Administration. It was necessary to try to catch up. The budget I had to defend in personnel research and development alone was, as I recall, over \$12 million plus \$7 million in human performance R & D. This was indeed a contrast to 1940 when we had to bail out the Army by having our occupational analysts from the Old Employment Service do the research and development work on human resources.

I left the Pentagon a couple of months after the assassination. I felt sure that Kennedy was going to resolve the Vietnam situation without a ground war. I had worked full-time in the Pentagon during the Cuban missile crisis and from the inputs I had about East Asia, it seemed to be that Kennedy was too smart to permit an all-out involvement.

Working for the Pentagon was a delight in many ways. I had no staff except a part-time secretary and two contracts: one with the Institute for Defense Analysis in which I utilized the talents of Orlansky, his consultants and staff: the other, a Smithsonian Institution Contract under the leadership of Charles Bray, with a corps of high level talent for research planning. My counterparts in the Army, Navy, Air Force, and NATO were all competent and cooperative.

In Department of Defense I felt free to communicate with anyone in the world with whom I felt I had legitimate business. Also, I could communicate informally with anyone in the Department of Defense by telephone to obtain information for my use. Professional affairs were treated as official business, such as my dealings with APA, whereas in the old Department of Labor days one felt it necessary to use his personal stamps for postage on APA business.

Incidentally, after World War II, the Employment Service, had gotten very limited support for research. In my new job, I promoted getting some funds transferred across the Potomac to help in the revisions of DOT and the further development of the general aptitude test battery. However, it took the poverty programs in the Johnson Administration to really stimulate the civilian sector and give the Employment Service a boost.

When I returned to the OSU Campus in 1964, I became Associate Dean and Director, Research Division, College of Commerce and Administration as well as Chairman of the Personnel Research Board. I had a part-time appointment in psychology and taught in the Industrial Organizational area.

At this time I was interested in models for predicting administrative decisions. We used one of the models to attempt to predict whether or not the Israelis would initiate a war in Spring of 1967. Only one participant in the seminar hit it right. He was a doctoral candidate in social psychology and reserve officer on leave from the Israeli Armed Forces. I am sure he had information the rest of us did not share in our models!

In another case we attempted to predict a decision President Johnson would make in regard to selective service policy. This turned out to be correct, at least as far as I was concerned, but I had been a consultant on the decision, largely by telephone, and I had input not available to the others (although I shared the information with them.)

In June 1963, after finishing off a couple of publications on organizational values, I became Emeritus Professor in Psychology in the College of Social and Behavioral Sciences and Emeritus Professor in Research in the College of Administrative Science.

Since then, in addition to travel and recreation, I have been involved as a consultant, both formal and informal. I also like to review the present status and outcome of the many research projects in which I took part; and last, but not least, to learn of the many significant accomplishments of former students and younger colleagues.

From 1971 to 1973, I was technical consultant for research evaluation, Department of Health, Education and Welfare. In 1972, I was invited by the Yugoslav government to participate in their manpower research symposium. I was the only American, and I presented a paper covering occupational research in the Department of Labor over a 37-year period. This program has progressed exceedingly well.

As a matter of ideology and policy I have long believed in retirement, and I think one should plan it as part of his occupational career. There are not enough paying jobs in our program for full employment at all ages. Youngsters should be kept as long as possible in schools and colleges--outside the labor forces. Likewise, retirement is a matter of opportunity and right in a democratic society. Better qualified younger persons with families are waiting in line for advancement. From a mere selfish point of view, I felt I had contributed many dollars to three retirement systems and to private investments, and I, as an only child from an Iowa farm, wanted to personally enjoy the fruits of the savings. That is what I am doing now!

SELECTED PUBLICATIONS

Publications

A Selection Test for Electrical Troublemens. *Personnel Journal*, Vol. 11, No. 3, 1932, pp.177-183.

Clinical Approach to Foremanship. *Personnel Journal*, Vol. 13, No. 3, 1934, pp. 135-137.

Dictionary of Occupational Titles, Parts I, II, III (presented under my general direction.) U. S. Government Printing Office, 1939. Also supplements.

Occupational Counseling Techniques - Their Development and Application. William H. Stead, Carroll L. Shartle, and Associates. American Book Company, 1940.

Oral Trade Questions (covering 300 occupations, prepared under my general supervision). U. S. Government Printing Office, 1940.

Occupational Analysis Activities in the War Manpower Commission. *Psychological Bulletin*, November 1943.

Occupational and Vocational Counseling of Military and Civilian Personnel During the Period of Post-War demobilization and the Years Immediately Therafter. *Psychological Bulletin*, Vol. 41, No. 10, 1944, pp. 697-705

Ten Years of Occupational Research. *Occupations*, Vol. 22, No. 7, 1944, pp. 397-446. (With others.)

Job Analysis for Retail Stores. ???, Maynard, and Shartle. Research Monograph, Ohio State University, 1946.

Developments in Occupational Classification. *Journal of Consulting Psychology*, Vo. 10, No. 2, 1946, pp. 81-84.

Occupations in Psychology. *The American Psychologist*, Vol. 1, No. 12, 1946, pp. 55-584.

Vocational Counseling and Placement in the Community in Relation to Labor Nobility, Tenure, and Other Factors. New York: Social Science Research Council. Committee on Labor Market Research, Pamphlet No. 5, January, 1948, p. 18.

Leadership and Executive Performance. *Personnel*, Vol. 25, No. 5, 1949, pp. 370-380.

Job Analysis and Job Classification and Evaluation. In D. H. Fryer & E. R. Henry (Eds.), *Handbook of Applied Psychology*. Vol. 1, New York: Rhinehart, 195X, pp. 135-142, 160-162.

Industrial Psychology, In *Annual Review of Psychology*, Vol. 1, 1950, pp. 151-72, Stanford, California: Annual Review, Inc.

Job Analysis and Job Evaluation. *Personnel Handbook*, edited by John F. Mee, New York: Ronald Press Company, 1951, pp. 125-134.

Studies in Naval Leadership, Part I. *Groups, Leadership and Men: Research in Human Relations*, edited by H. Guetzkow, Pittsburgh, Pa.: Carnegie Press, 1951.

Occupational Information. Englewood Cliffs, N. J.: Prentice Hall, 1946. Revisions, 1952, and 1959.

Methods in the Study of Administrative Leadership. Monograph No. 80, Columbus: The Ohio State University, 1955. (With Ralph M. Stogdill.)

Executive Performance and Leadership. Englewood Cliffs, N. J.: Prentice-Hall, 1956; London: Staples Press, 1957. Also as *Direccion y ???* Mexico City: Heruero Hermanos, 1960.

A Theoretical Framework for the Study of Behavior in Organizations. In A. W. Halpin (Ed.). *Administrative Theory in Education*. Chicago: University of Chicago, Midwest Administration Center, 1958, pp. 73-88.

Blueprinting the Next Ten Years of Industrial Psychology. (A Symposium) *Personnel Psychology*, Vol. 12, 1959, pp. 40-45.

Leadership and Organizational Behavior. In L. Petrullo and P. M. Bass (Eds.), *Leadership and Interpersonal Behavior*. New York: Holt, Rinehart & Winston, 1961, pp.310-325.

The Occupational Research Program: An Example of Research Utilization. In *Case Studies in Bringing Behavioral Science Into Use*, 1961, *Stanford University Studies in Utilization of Behavioral Science*, Vol. 1, pp. 5X-72.

Occupational Analysis, Worker Characteristic, and Occupational Classification Systems. In Henry ??? (Ed.), *Man In a World of Work*. Boston: Houghton-Mifflin Co., 1964, pp. 235-310.

An Approach to Dimensions of Value (with Gary. Brunback and John R. Rizzo). *Journal of Psychology*, Vol. 57, 1964, pp. 101-111.

An Interaction Model for Administrative Decisions. *Praksenlogia*, Mr. 39/40, 1971, pp. 311-316. (Warsaw)