

Research Report 1155

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# THE RESEARCH PSYCHOLOGIST IN THE ARMY-- 1917 TO 1977

J. E. Uhlaner

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April 1968

(Second Revision, October 1977)

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2. continued)

-Report is an expanded version of material prepared to supplement a paper by Dr. J. E. Uhlaner delivered as part of a symposium "The Growth and Future of Military Psychology" at the 1<sup>st</sup> convention of the American Psychological Association. The present version incorporates contributions solicited from psychologists known to be authoritative in areas of behavioral science research conducted by or for the Army.

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## FOREWORD TO THE FIRST EDITION

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A preliminary version of the present report was prepared to supplement an invited paper on the scope of activities and technical advances in military psychology in the Army delivered by the writer at the 1967 convention of the American Psychological Association. The paper was part of a symposium, "The Growth and Future of Military Psychology," organized and chaired by Dr. Jack W. Dunlap, president of Dunlap and Associates.

The comments and additions offered led to the decision to expand the historical material somewhat and make it available in report form. Additional contributions were solicited from psychologists known to be knowledgeable in areas of behavioral science research conducted by or for the Army, and these were incorporated in the present version.

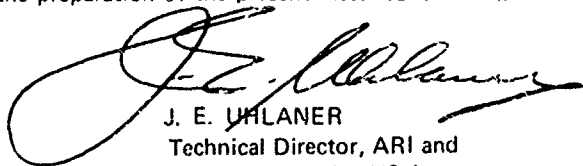
Of the accuracy of the factual material included in the chronology the writer feels reasonably assured. To have provided the precise documentation appropriate to an official history would have required many more man hours amounting in all likelihood to man years--than could have been spared from ongoing research activities. For some of the accomplishments, no beginning or end date could be established. Indeed, many such accomplishments were found to have had no precise beginning or end. In those cases, it was believed more important to chronicle the main currents of research developments than to insert here and there dated items on lesser actions connected with the broader development.

The author acknowledges with deep appreciation the accounts of events and clarifications contributed by representatives of organizations engaged in various forms of psychological research for the armed forces. Without the contributions of these research scientists, the chronology would certainly not reflect to the extent that it does a balanced development of human factors research activities in and for the Army. For any errors in content, the writer of course takes full responsibility.

Notable among contributors were Dr. Preston S. Abbott, Director, Center for Research in Social Systems, The American University, Washington, D. C., Dr. Meredith P. Crawford and Dr. Robert G. Smith, Jr., Director and Assistant Director for Operations, respectively, of the Human Resources Research Office, The George Washington University, Alexandria, Virginia, Dr. E. Ralph Dusek, Director, Behavioral Sciences Laboratory, U. S. Army Institute for Environmental Medicine, Natick, Massachusetts, Dr. Lynn E. Baker, U. S. Army Chief Psychologist, Behavioral Sciences Division, Office of the Chief of Research and Development, Lieutenant Colonel James L. Hedlund, Chief, Biomedical Stress Research Branch, U. S. Army Medical Research and Development Command, Washington, D. C., Dr. John M. McGinnis, Behavioral Sciences Division, U. S. Army Natick Laboratories, Natick, Massachusetts, and Dr. John D. Weisz and Dr. Leon Katchmar, Director and Deputy Director, respectively, of the U. S. Army Human Engineering Laboratories, Aberdeen, Maryland.

The author also wishes to express special appreciation of the professional efforts of Miss Emma E. Brown, U. S. Army Research Institute for the Behavioral and Social Sciences, who contributed substantively to the content of the report and assisted in the compilation.

Finally, the author would like to thank Dr. Dunlap for inviting him to participate in the 1967 symposium. This participation was the stimulus for the preparation of the present historical account.



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## PREFACE

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The events set down in the following chronology illustrate how military psychology has grown both in the nature of the problems attacked and in the elaboration of its methodology since the first spontaneous movement of psychologists in 1917 to place their competence at the service of their country. In 1939, when the armed services again were in urgent need of the techniques of applied psychology, psychologists had at their disposal psychological principles and techniques that industry, education, social service agencies, and medicine had been developing during the 20 years that military psychology had been in virtual abeyance. Yet military psychology activity again, as in 1917, began at almost the lowest echelon in the chain of command and moved up only slightly during the war years.

One clearly discernible movement since World War II has been the upgrading of organizations whose main concern is human factors research, whether it be personnel measurement, physiological psychology, human engineering, clinical psychology, manned systems, or organizational effectiveness. The oldest organizational entity in military psychology serves as an example. What is now the U.S. Army Research Institute for the Behavioral and Social Sciences had its inception as a unit, then became a section of a huge personnel management organization, the Army's Classification and Replacement Branch. The Personnel Research Section became a branch in 1953. The organization became the U.S. Army Personnel Research Office under the Chief of Research and Development in 1961, and a laboratory in 1966. A parallel development could be traced for many other research organizations.

In 1969, the U.S. Army Manpower Resources Research and Development Center (MANRRDC) and the U.S. Army Motivation and Training Research Laboratory were established, along with the U.S. Army Behavior and Systems Research Laboratory. In 1972, the U.S. Army Research Institute for the Behavioral and Social Sciences put under one unified headquarters all operational research and development endeavors of the Office of the Chief of Research and Development in the behavioral and social sciences.

What determines the upsurge and ebb of an area of research--or, for that matter, of any research program that must serve many military management objectives? From the beginnings of military psychology in the Army, the demands generated by crisis or emergency have taken precedence over all others. When there is armed conflict or threat of armed conflict, research in support of combat troops and operations takes on immediacy. It may be war, limited military action, a blockade. Even in periods of lesser emergency, relevance to the Army's mission exerts a powerful force in shaping programs of research. This is not to say that in military psychology there is no place for fundamental research. Indeed, the broader and more general the application of experimentation the more valuable the results are likely to be to the Army as well as to the research community.



In sustained need as in crisis, the research undertaken and the way it is conducted are governed by the technological stage attained by the relevant discipline. Are current techniques and methodologies adequate to deal with a given problem? Long periods of development are required to bring the state-of-the-art of a discipline--and even more the art of multi-disciplinary research--to the point where it can contribute significantly to certain areas of man's activities.

One determinant of the resources available is the changing character of the professional pool from which scientists are drawn. There are fashions in specialties of scientific training as there are popular "majors" in undergraduate institutions. Factors which stimulate these choices may reflect knowledge of opportunity for productive research or scope for scientific creativity as well as--inevitably--the attitude of the scientific community toward the research objectives and comparative personal rewards.

The material resources provided are an inescapable consideration. I refer not only to pay and career benefits sufficient to draw to an organization research scientists who are competent and creative, able to take the initiative in formulating and directing a research program. I am thinking also of the physical facilities and sophisticated equipment and the relative ease with which what is needed can be procured. For example, how much of a research scientist's time and persuasion must be expended in establishing and equipping a laboratory? And where the physical equipment for experimentation is a minor requirement, does the organization provide the physical--and personal--environment conducive to creative effort? Is there an avenue for publication of the scientist's reports in a form which can yield individual recognition and professional satisfaction?

The kind of interaction prevailing between research and user elements is an important determinant of an applied research program. Further, the kind of interaction between research scientist and civil or military leadership is influential in determining the broad direction of an applied research program. The research scientist has a special insight into the kinds of problem to which his disciplines can profitably be applied. He knows how to structure the problems for a research solution. It is his job to detect areas--however amorphous the problems may seem at first--in which his competence holds promise of increased military effectiveness. And if the organization is to realize its potential, it must inculcate understanding of the way in which the capabilities of the organization can be useful. Sensitivity to the needs of the user and responsiveness to those needs can stimulate the formulation of problems hitherto unexplored by empirical methods and mark a forward thrust in the contribution of military psychology.

Finally, some research historians may credit fortuitous events as a major determinant of research. Military psychology, in fact, got its start through just such a fortuitous event on April 6, 1917. On that day, a meeting of experimental psychologists under the auspices of the American Psychological Association was being held in Emerson Hall of

Harvard University. In point of fact, one scheduled session was devoted to a discussion of how psychologists might assist the defense effort. In the midst of this meeting, a messenger burst into the session chambers with the grave announcement that our country had just entered the conflict. Then and there, Dr. Yerkes and a small group of forward-looking psychologists suspended the regular convention meeting and put in motion most energetically a series of actions, including letters that same day to members of the Council of the American Psychological Association and to the National Research Council outlining what psychology could do for the national defense effort.

In addition, exercising his leadership in the profession, Dr. Yerkes obtained the spontaneous and unanimous support of his colleagues for immediate action. The consensus was to offer the concerted efforts of psychologists to the U. S. armed forces. For some, the effort meant volunteering for military service and at the same time carving out critical posts in which psychologists could best serve. In the spring of 1917, the first U. S. military psychological effort had its inception under Captain Yerkes of the Sanitary Corps, starting with the problem of enlisted classification.

The day when major research programs arise out of incident is probably past. Since that day in 1917, military psychology has--as shown by the historical account presented here--first branched out into many fields, applying severally its varied disciplines, and then moved to bring the several disciplines together in a united attack on broad problems.

The mid-period of the history of military psychology saw the establishment of many different research organizations, each devoting its efforts to a segment of the Army's human factor problems--selection, training, psychophysiological processes, adjustment and rehabilitation, human engineering, operations research. Yet the Army's research scientists had already begun to seek wider scope for their potential. The organizational changes which followed were in the direction of permitting research and development to attack a problem in broader terms and strive toward a more comprehensive solution.

With research in behavioral science fully accepted and integrated as an element of the Army's research and development activity, there began what has developed into a full-fledged program of research planning. Organization of RDTE activity into six categories--research, exploratory development, advanced development, engineering development, management and support, operational system development--fosters an orderly program of long-range, mid-range, and short-range research (the latter with the techniques of immediate application) and promotes balanced support. No longer are research projects separated by barriers to pooled interests and joint conduct. Cross-discipline conferences are commonplace, and many are regularly scheduled. Partly through such conferences, and the exchange activities they generate, a sophisticated systems-oriented thinking has come to pervade all elements of the management-research complex.

In the early 1960's, awareness grew that military commanders sought added contributions from human factors scientists. National defense was conceived of as a complex of weapons systems, personnel systems, information systems. What commanders wanted from research was measurement of results achieved by the system--the men and equipment at their disposal. Responsive to these needs--for the most part implicit--system-oriented research programs have evolved in many service-connected laboratories.

The manned systems approach builds on the techniques and knowledge derived from the classical fractions of military psychology. The role of research in selection, training, work methods, fatigue effects, environmental effects, human engineering, performance evaluation, is evident in the pages which follow. The classical concept of a fractionated criterion, however carefully defined, does not suffice for the modern military user. It is the "mission accomplished" impact he seeks, and it is this impact that the total systems criterion must reflect, considering the full range of system variables and their interaction. The objective is to measure and interrelate a variety of human factors variables including individual differences, selection-assignment specifications, training, work methods, and equipment. Determining these interrelationships and use of mission accomplishment as the criterion constitute the goal of the military research psychologist concerned with broader and more significant support of the military manager today.

Certain principles have won wide-spread acceptance among systems-oriented human factors research scientists:

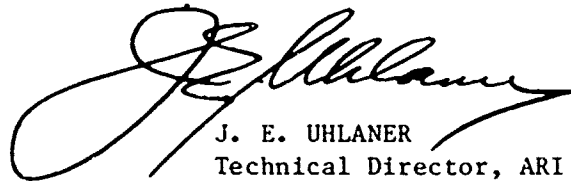
1. Measurement is essential in systems research.
2. While not all relevant variables in a system can be varied in a single experiment, their existence--and interaction and interface effects--must be taken into account.
3. Computers have a commanding role in systems-oriented human factors research, contributing both to the experimentation proper through simulation and to the processing of data and evaluation of results.
4. Much more methodological research is requisite to effective treatment of the huge number of variables that must be taken into account and the simulation of environmental factors to achieve realism without sacrificing rigor of experimentation.

The essence of the broadened approach is the measurement and interrelation of a variety of human factor variables including individual differences, selection-assignment specifications, training variables, work method variables, organizational development factors, equipment factors, variables that take cognizance of social change, and processes and interactions affecting individual and organizational effectiveness. Determining these interrelationships and use of mission accomplishment as the focal point constitute the goal of military research psychologists today.

Research is proceeding toward the broad objective of presenting, on a cost basis, given measures of accuracy, completeness, and timeliness of the output of the individual mission to be accomplished:

- . information on the type of individuals;
- . information on the kind and length of training;
- . information on the kind of physical and organizational environment in which the mission is to be accomplished.

The system measurement bed is one approach to accomplish the above.



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# THE RESEARCH PSYCHOLOGIST IN THE ARMY--1917 TO 1977

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## BEGINNINGS, 1917 TO 1921:

### EVENTS AND ORGANIZATIONAL CHANGE

*6 April 1917. U. S. declaration of state of war with Germany.*

*6 April 1917.* On receiving word of the declaration, the president of the American Psychological Association, Robert M. Yerkes, together with Herbert S. Langfeld, called a special session of the conference of APA experimental psychologists then meeting at Harvard, for the purpose of discussing the relations of psychology to national defense. At this session a committee was appointed (Robert M. Yerkes, Walter Van Dyke Bingham, Raymond Dodge) to gather information concerning the possible relations of psychology to military affairs and to further the application of psychology to military problems. On the evening of the same day (6 April), the committee prepared a letter to members of the Council of the APA urging that psychologists render the government all possible assistance in connection with psychological problems arising in the emergency and further the development and application of psychological methods to the immediate problems of military selection.

*28 May 1917.* A special committee on Methods for Examining Recruits met at Vineland, N. J., with Robert M. Yerkes as Chairman, and began work on classification testing methods and procedures. The meeting followed some weeks of arrangements between the APA, the National Research Council, and The Surgeon General of the Army. Original members, in addition to Dr. Yerkes, were Walter V. Bingham (Secretary), G. M. Whipple, H. H. Goddard, T. H. Haines, L. M. Terman, and F. W. Wells.

Military psychology in World War II, particularly in the early stages, drew heavily on what can be considered the phenomenal accomplishments of a small group of psychologists in World War I. These men undertook to channel the country's psychological resources--then relatively small (in 1917, membership in the American Psychological Association totaled 336)--in support of personnel management in the armed services.

### RESEARCH ACHIEVEMENTS AND DIRECTIONS

The Psychology Committee of the National Research Council, in close affiliation with appropriate APA committees, was encouraging activities pertinent to military psychology problems. Madison Bentley, at the University of Illinois, was examining scientific literature on military psychology. Raymond Dodge, Wesleyan University (Connecticut) was perfecting an apparatus for use in selecting and training naval gun pointers. Harold E. Burt and W. R. Miles in Boston and E. L. Thorndike at Columbia University, George M. Stratton in Berkeley, and several others were analyzing the qualifications of successful aviators and trying out tests that might aid in predicting the likelihood that a candidate would make good as a fighting flyer. R. S. Woodworth, Columbia University, was attacking the difficult problem of tests to predict courage and self-mastery under conditions of strain and terror.

From their adaptation of group tests devised by Arthur S. Otis were developed the Army Alpha (for the classification of literates) and the Army Beta (for illiterates), the latter largely developed by N. J. Malville and E. A. Doll. C. C. Brigham, E. L. Thorndike, and C. S. Yoakum played a large part in the revision of the tests on the basis of unofficial and later official tryout.

## EVENTS AND ORGANIZATIONAL CHANGE

*5 August 1917.* Committee on Classification of Personnel in the Army established in The Adjutant General's Office. Walter Dill Scott, Director. Members included: E. L. Thorndike, W. V. Bingham, J. R. Angell, E. K. Strong, Jr., L. M. Terman, J. B. Watson, R. M. Yerkes, Raymond Dodge, R. C. Clothier, H. L. Gardner, J. F. Shepard. Civilians associated with the work of the committee included: C. J. Whipple, Beardsley Ruml, Truman L. Kelley, Rudolph Pintner, Herbert A. Toops, L. L. Thurstone, G. M. Whipple. E. A. Wood.

*17 August 1917.* Robert M. Yerkes, President of the American Psychological Association, appointed Major in the Sanitary Corps, Medical Department of the Army, to organize and direct psychological examining.

*19 January 1918.* Organization of a Division of Psychology, Office of The Surgeon General in The Adjutant General's Department. Officers commissioned in the Division of Psychology to October 31, 1919 included (highest rank shown): Harold C. Bingham (Maj), Edwin G. Boring (Capt), Karl M. Dallenbach (Capt), Edgar A. Doll (1st Lt), Horace B. English (Capt), William S. Foster (Maj), Melvin E. Haggerty (Maj), H. H. Hildreth (Pvt), Walter S. Hunter (Capt), Carl A. Murchison (1st Lt), Arthur S. Otis (1st Lt), Donald G. Patterson (Capt), Albert T. Poffenberger (Capt), Lewis M. Terman (Maj), Raymond H. Wheeler (Capt), William R. Wilson (2d Lt), Benjamin D. Wood (1st Lt), Robert M. Yerkes (Maj) (Head of Division), Clarence S. Yoakum (Maj), and on the advisory staff, T. L. Kelley, E. L. Thorndike, G. M. Whipple.

*4 February 1918.* School of Military Psychology established in the Medical Officers Training Camp, Fort Oglethorpe, Georgia.

*9 May 1918.* Development Battalions authorized "to relieve other organizations of all unfit men; to conduct intensive training with a view to developing such men; promptly to rid the service of all men who, after thorough trial and examination, are found physically, mentally, or morally incapable of performing duties of a soldier."



## RESEARCH ACHIEVEMENTS AND DIRECTIONS

The committee was in effect responsible for the development of all classification procedures other than psychological examining, which was the responsibility of the Division of Psychology, Office of The Surgeon General.

Parallel in point of time was Walter Dill Scott's campaign for the introduction of systematic methods of judging and rating the qualifications of officer candidates.

The Division was authorized to organize and administer psychological examining throughout the Army, including preparation, revision, and standardization of methods of examining, instructions for administrative use, data collection, and analysis of results.

The mission of the School was to supply personnel for the classification program. Approximately 100 officers and more than 300 enlisted men were trained at the School.

Training in Development Battalions was expressly limited to men whose condition could be improved by treatment, physical training, or instruction. Illiterates and men who did not have sufficient knowledge of English to perform their duties properly were included. In the approximately six months of their operation (to 30 December 1918), about 230,000 men were in the Development Battalions for varying periods of time. At the end of training, 120,672 men were rated as warranting assignment to military duty.

## EVENTS AND ORGANIZATIONAL CHANGE

14 August 1918. General Orders No. 74, establishing psychological service, issued by the War Department.

23 January 1919. Psychological service as organized during the draft discontinued. The Adjutant General ordered the appointment of two civilian psychologists to prepare methods and keep them up to date.

19 May 1919. Action of 23 January rescinded. The Adjutant General ordered The Surgeon General's Office to retain two psychologists in military service.

1919. Publication of The Personnel System of the United States Army, Volumes I and II, by the War Department.

1921. Publication of Psychological Examining in the United States Army, edited by Robert M. Yerkes. Official Report of the Division of Psychology, The Surgeon General's Office, published with the approval of the Department of War.

## RESEARCH ACHIEVEMENTS AND DIRECTIONS

The War Department directive enabled activation of the testing program. By 31 January 1919, a total of 1,726,966 men had been examined psychologically, including 42,000 officers. More than 83,500 of the enlisted men had been given individual examinations in addition to the group test.

Landmarks in military personnel psychology dating to the 1917-19 period include, in addition to group mental tests, the use of Army grades representing a coarse grouping according to ability to learn, oral trade tests to assess job knowledge, job specifications, an officer's qualification card, and other standard forms and procedures for administering the program.

Tests and other evaluative techniques were used to identify the mentally incompetent, to classify men according to their mental capabilities, to assist in selecting potential officers, commissioned and noncommissioned, as well as personnel for special assignments. In addition, civilian and military psychologists serving during World War I performed many other functions, including lecturing on training methods and advising officers concerned with training, and planning and conducting programs--both educational and therapeutic--for Development Battalions and Special Training Companies. The psychologists assisted in the evaluation of neuropsychiatric patients at base hospitals, and in the development of methods and procedures to stimulate combat effectiveness and morale.

**INTERIM PERIOD, 1921 TO 1939:**

The Army resumed pre-World War I procedures, reinstating what was in effect an apprenticeship system of selection and assignment.

In industry and education, advances were made in aptitude testing, vocational guidance, personnel evaluation, and management. By 1939, the American Psychological Association had 618 members and 1909 associate members.

## WORLD WAR II, 1939 TO 1945:

### EVENTS AND ORGANIZATIONAL CHANGE

*March - April 1939.* Personnel Testing Section established in the Office of the War Plans Officer, The Adjutant General's Office, War Department. Reserve Officers with psychological training were assigned to the unit. Marion W. Richardson was appointed consultant.

*September 1939.* Emergency Committee in Psychology established by the Division of Anthropology and Psychology of the National Research Council (NRC).

*October 1939.* Committee on Selection and Training of Aircraft Pilots established by NRC at the request of the Civil Aeronautics Society.

*May 1940.* Committee on Classification of Military Personnel, Advisory to The Adjutant General, established by NRC, at the request of TAG.

*24 May 1940.* First meeting of the Committee. Original members were: Walter V. Bingham, Chairman; C. C. Bragdon, H. E. Garrett, L. S. O'Rourke, C. L. Shartle, and L. L. Thurstone. Later members included C. Frederick Hansen, Marion W. Richardson, and Walter R. Miles (ex-officio).

When efforts of psychologists were marshaled in 1939, compelling needs of the armed services governed activities. Yet solutions to immediate problems were sought with a rapidly growing Army in mind, and plans were laid with a view to assisting in the management of what came to be the largest personnel system in history. Many developmental tasks were concurrent and overlapping. While measures were being readied for immediate use, work was undertaken to devise new and more satisfactory approaches. There are evidences of concern with problems there was no time to pursue.

### RESEARCH ACHIEVEMENTS AND DIRECTIONS

The fundamental job was mass evaluation to facilitate classification of recruits for training and job assignment. The Adjutant General and advisory psychologists decided on the "construction" of a new classification test with emphasis on "trainability." By August 1939, the Army General Classification Test AGCT 1a was ready for standardization. It was first used in October 1940. A second form was introduced in April 1941. Two additional forms, 1c and 1d, providing improved discrimination, replaced 1a and 1b in October 1941. Non-language tests for illiterates, mechanical and clerical tests, and trade tests were prepared. By the end of the war, AGCT in its various forms had been administered to over 9,000,000 men.

Organization of the committee consolidated psychological examining, including development of instruments and procedures, classification, assignment, and other personnel functions, under The Adjutant General. Until the end of the war, classification of enlisted men rested primarily on civilian experience, on the single score obtained on the AGCT, plus supplementary indications based on mechanical aptitude and clerical aptitude tests, aptitude for code learning for radio-code operators, and oral trade tests to verify skill status. As early as 1942, planning began for AGCT-3, a test of four parts, separately administered and yielding scores on Reading and Vocabulary, Arithmetic Computation, Arithmetic Reasoning, and Pattern Analysis (spatial relations), as well as an overall score. AGCT 3a was introduced in April 1945, 3b the following year.

## EVENTS AND ORGANIZATIONAL CHANGE

*July 1940.* Personnel Research Section (PRS) established in the Executive Division, TAG, incorporating the Personnel Testing Section. Among psychologists early connected with the Section as officers or civilians were: Kenneth Ashcraft, Donald E. Baier, Harold Bechtoldt, Roger Bellows, Harold C. Bingham, Reign Bittner, H. E. Brogden, Harry Bues, David J. Chesler, Ruth Churchill, Clyde Coombs, Karl Dallenbach, Alvin C. Eurich, T. W. Harrell, Stanley C. Markey, Bronson Price, E. A. Rundquist, W. A. Schraeder, Carl Wilder, Louise Witmer (Cureton). Before 1946, many other psychologists had contributed to the work of the Section, including Ruth Bishop, E. S. Bordin, Emma Brown, Kenneth E. Clark, Charles Collins, E. E. Cureton, Mitchell Dreese, Douglas H. Fryer, E. R. Henry, Reuben Horlick, Thornton C. Karlowski, Raymond A. Katzell, David R. Krathwohl, Russell G. Leiter, E. F. Lindquist, Irving Lorge, Grace Manson, Richard H. Paynter, Ruth Pederson (Richardson), Evelyn Raskin, John F. Scott, E. Donald Sisson, C. P. Sparks, Naomi Stewart, Calvin W. Taylor, E. K. Taylor, R. M. W. Travers.

*16 September 1940.* Selective Training and Service Act.

*22 October 1940.* Reorganization of the Army Personnel System.

*30 October 1940.* Directive, "Army Psychological Tests," issued by TAG. The Personnel Research Section was named as the agency to develop tests, assist in the classification of military personnel, coordinate research studies, and help in arranging and installing test programs.

*November 1940.* First selective service inductees arrived at induction stations and were administered the AGCT and interviewed. Qualification cards were prepared, and inductees were given "recommended" assignment and sent to training centers.

*5 February 1941.* Personnel Research Section transferred from Executive Division to the Personnel Bureau, TAG.



## RESEARCH ACHIEVEMENTS AND DIRECTIONS

Selection of officer candidates first utilized a test produced by Cooperative Test Service to determine ability to meet OCS academic requirements. In the same year, the Personnel Research Section prepared a variation of the AGCT (Higher Examination H-1 and H-2) which was used until the beginning of 1944 when OCT-1 and -2 were authorized. The combat leadership aspects of officer candidate selection were recognized, but exploratory studies did not result in satisfactory prediction. Efforts to select officer material on the basis of personality measures were renewed and intensified at the end of the war.

Interest in personality measures was expressed in the Committee on Classification of Military Personnel as early as 1941. At the same time, prior experience with personality testing indicated that the best hope of providing measures adequate to the Army's needs lay in long-term intensive experimentation to develop rationale and methodology. By 1944, PRS was concerned with a number of problems for which measures of personality were sought--prediction of behavior under typical Army conditions, differential diagnosis of neuropsychiatric patients in Army and VA hospitals, conduct of mental hygiene programs in Army training centers, selection of personnel for special duties. Tests used experimentally included the Minnesota Multiphasic Personality Inventory (MMPI), the Cornell Selectee Index, specially constructed personal inventories, and the Army Individual Test of General Mental Ability.

A set of tests constructed to predict academic success in the U. S. Military Academy included mathematics and language aptitude, the latter employing an artificial language device used in language aptitude tests that are current today.

A set of achievement and aptitude tests was constructed by the Personnel Research Section for use in the Army Air Corps program for the selection and training of aircraft pilots. These tests were the forerunners of the Aviation Cadet Qualifying examinations.

Selection programs were also prepared for Warrant Officers, Army truck drivers, Coast Artillery, Military Police, and Combat Intelligence, among others. Examinations of technical ability in 30 Warrant Officer specialties were produced. The line of research to test ability to see at night began early in the war continued with many variations through 1960 when the Army Night Seeing Tester was developed.

## EVENTS AND ORGANIZATIONAL CHANGE

*27 May 1941. Declaration of Unlimited Emergency in the United States.*

*7 December 1941. Pearl Harbor*

*May 1941 - August 1942. Stated induction policy: Men who could not read and write at fourth-grade level were not accepted.*

*October 1941. Research Branch established in the Information and Education Division, War Department, to provide the Army command with facts about the attitudes of soldiers which might be helpful in policy formation. With Frederick H. Osborn (Maj Gen), Chief of the I & E Division, and Edwin H. Guthrie and Allen Edwards of the Special Studies Section, Intelligence Division, preparatory organization and planning of the technical program was the responsibility of Rensis Likert of the Department of Agriculture, Quinn McNemar of Stanford, and Samuel A. Stouffer. Other consultants contributing to formulation of programs and development of measurement techniques were Louis Guttman of Cornell, John Dollard of Yale, Hadley Cantril of Princeton, Philip M. Hauser of the Bureau of the Census, Paul F. Lazarsfeld of Columbia, Robert K. Merton of Columbia, Frederic Mosteller of Princeton, Frank Stanton of the Columbia Broadcasting Co., Donald Young of the Social Science Research Council, and Kimball Young of Queens College.*

*14 May 1942. Women's Army Auxiliary Corps (WAAC) established. Became Women's Army Corps (WAC) 1 September 1943.*

*20 June 1942. Ninety-three first lieutenants and ninety-three second lieutenants authorized for appointment as Army Specialist Corps psychologists and personnel consultants at Induction Stations. In July, nine officers were appointed to The Adjutant General's School as personnel consultants.*

## RESEARCH ACHIEVEMENTS AND DIRECTIONS

The Research Branch obtained opinions of combat troops and analyzed the information quantitatively to provide basic data on soldier attitudes. In 1943-44, detailed studies were made of the opinions of troops in 10 rifle companies with combat experience in North Africa and Sicily and three divisions in the Pacific, including flying combat personnel. The Branch maintained close association with the Neuro-psychiatric Division of The Surgeon General's Office (William C. Menninger (Brig Gen) was head of the Army's psychiatric service) and with psychologists of the Classification and Replacement Branch of The Adjutant General's Office, including Walter V. Bingham (LTC), Marion W. Richardson (LTC), and Clyde Coombs (Maj). In the Air Force, T. W. Harrell (Maj) and John C. Flanagan (COL) were available for a number of studies.

## EVENTS AND ORGANIZATIONAL CHANGE

*Spring 1942.* Six clinical psychologists were commissioned as first lieutenants in the Sanitary Corps of the Army Medical Department and assigned to six general hospitals for duty with neuropsychiatric services: Michael Dunn to Darnall General Hospital, Danville, Kentucky; Robert M. Hughes to Lawson General Hospital, Atlanta, Georgia; James W. Layman to Walter Reed General Hospital, Washington, D. C.; William C. Murphy to Letterman General Hospital, San Francisco, California; Lawrence I. O'Kelly to Fitzsimons General Hospital, Denver, Colorado; and L. Grant Tennies to McCluskey General Hospital, Temple, Texas.

*1 August 1942.* Induction policy changed to admit men who could not meet the literacy standards, provided they had "sufficient intelligence to absorb military training rapidly."

*28 August 1942.* Classification and (Enlisted) Replacement Branch established, incorporating the Personnel Research Section, which was responsible for preparation and installation of all tests used in (1) induction, (2) initial classification, (3) reclassification and selection for specialist training, and (4) selection for special assignment such as officer candidate school, combat intelligence, military police. Classification procedures were in the hands of the Procedures Section of the Branch.

*November 1942.* One hundred thirty Army Specialist Corps psychologists commissioned in the Army of the United States (AUS).

*April 1943.* The U. S. Army Quartermaster Climatic Research Laboratory established at Lawrence, Massachusetts as a field installation operating under the Environmental Protection Section, Research and Development Branch, Military Planning Division, Office of the Quartermaster General (OQMG), Department of the Army, Washington, D. C.

## RESEARCH ACHIEVEMENTS AND DIRECTIONS

This "experiment", designed to ascertain what, if any, contribution clinical psychologists could make in the general hospital setting, was evaluated favorably in December 1942. By December 1943, coordination with The Adjutant General was begun with the aim of having additional clinical psychologists procured and assigned to medical facilities.

Beginning in 1941, a Minimum Literacy Test was administered to men who were unable to take the written classification test or whose performance gave reason to doubt their ability to read. With the induction of illiterates, non-language tests were used to identify those who would be able to learn the duties of a soldier.

Many of the illiterates were sent to the Army's Special Training Units established under the direction of Morton Seidenfeld. They were given instruction designed to bring them to fourth-grade level in verbal and arithmetic skills. The Personnel Research Section developed placement, promotion, and graduation tests for the units.

By the end of the war, a rather elaborate multiple-hurdle procedure of Induction Station testing was in operation. The first screening test per se was introduced 31 October 1942 for use with selective service registrants who were limited service for physical reasons. The test used was AGCT 1a, renamed R-1. Qualification and classification programs adapted to women were produced.

The mission of the Climatic Research Laboratory was to conduct research on the environmental protection of the soldier.

## EVENTS AND ORGANIZATIONAL CHANGE

*1 June 1943.* The Personnel Research Section moved physically to New York City where it remained until March 1947, retaining, however, its organizational position as part of the Classification and Replacement Branch, The Adjutant General's Office.

*10 July 1943.* Army Specialized Training Program for college training of enlisted men initiated under the Army Specialized Training Division.

*30 March 1944.* First Separation Center established at Fort Dix, New Jersey.

*20 April 1944.* Separation Classification Section established in the Classification and Replacement Branch, TAGO.

*1 July 1944.* Office of Chief Clinical Psychologist established in the Classification and Replacement Branch, TAGO. The few clinical psychologists then in the Sanitary Corps of the Army Medical Department were transferred to TAGO. Morton A. Seidenfeld was placed in charge of the office. Procurement of 175 psychologists for commissioning as officers was authorized. By the end of July 1945, 250 such officers had been obtained to provide neuropsychiatric services in Army hospitals. 1 September 1944, functions of Chief Clinical Psychologist in TAGO were transferred to the Clinical Psychology Branch, Neuropsychiatry Consultants Division, Office of The Surgeon General, and all clinical psychologists were detailed from TAGO to the Medical Department with assignment in the Medical Administrative Corps.

*9 September 1944.* A 22-day course for clinical psychologists was initiated at The Adjutant General's School, Fort Sam Houston, Texas.

## RESEARCH ACHIEVEMENTS AND DIRECTIONS

The Personnel Research Section prepared selection tests and procedures and set up an achievement testing program for college courses given under the ASTD program, constructing over 150 tests.

A counseling procedure was set up in which use was made of authorized Army tests, the USAFI General Educational Development tests, and commercial tests approved by the War Department.

Minimum qualifications for officers in the Office of the Chief Clinical Psychologist included a Master's degree in clinical, educational, or industrial psychology, with experience in clinical psychometry. Duties included providing counseling programs for convalescent patients, psychological testing, and aiding in classification and retraining of neuropsychiatric casualties.

The Adjutant General's School course for clinical psychologists included review of testing and interview techniques, hospital procedures, diagnosis, and therapeutic measures used in dealing with neuropsychiatric patients in Army hospitals. By the end of September 1945, when such training was terminated, eight classes had been taught, with a total of 281 students completing the course.

## EVENTS AND ORGANIZATIONAL CHANGE

*6 May 1945. V-E Day.*

*2 September 1945. V-J Day.*

*November 1945. Involuntary inductions stopped--procurement by enlistment only.*



## RESEARCH ACHIEVEMENTS AND DIRECTIONS

In February 1945, research was undertaken to develop scientific procedures to select officers for retention in the peacetime Army. In this effort, psychologists of the Personnel Research Section abandoned the concept of leadership as an entity, and based their approach on ascertaining the behavior, experiences, and qualities characterizing officers recognized as superior by their associates. The result was a package procedure making use of quantitative evaluations obtained with instruments other than cognitive paper-and-pencil tests--standardized interviews, evaluation forms, performance and situational tests, physical proficiency tests, peer ratings. These techniques were later adapted to selection programs for a variety of special assignments.

## EARLY POST-WAR YEARS, 1945 TO 1951:

### EVENTS AND ORGANIZATIONAL CHANGE

*1945 - 1946. Reduction of Army to peacetime status.*

*April 1946. First screening test introduced for enlistees.*

*1946. Anthropology Group established in the Climatic Research Laboratory of the Quartermaster Corps. Francis E. Randall, Chief.*

*1946. Regional food preferences studies initiated by W. Franklin Dove, biologist, at the Food and Container Institute for the Armed Forces, in Chicago.*

*1 July 1947. Efficiency report form WD AGO 67-1 directed for use in officer evaluation.*

Military psychology was sharpening its measurement tools and applying them in helping the Army in its adjustment to peacetime status and reduced numbers. The Army-associated human factors research organizations did not, as following World War I, abandon their activities in the military sphere, but rather accepted--and even sought to anticipate--the personnel and manpower resource problems of military management.

#### RESEARCH ACHIEVEMENTS AND DIRECTIONS

Between May and November 1946, a field survey of the anthropometry of 105,062 Army men was conducted at six Separation Centers. Several publications summarized the results and described the methodology. For many years these data were basic to sizing studies of Army clothing and for human engineering studies which required data concerning body measurements of the Army population.

In the spring of 1945, the Personnel Research Section had begun work on development of a new officer efficiency report. The effort, which sought to achieve objectivity through forced choice rating techniques, effectively concealing the resultant "score" from the rating officer, has been termed abortive. From an operational standpoint, it was, chiefly because officers preferred to know exactly what rating they were giving their subordinates. From the research standpoint, it was not, since the empirically derived scales produced a broader range of ratings and greater discrimination among individuals than had previous methods.

## EVENTS AND ORGANIZATIONAL CHANGE

*26 July 1947. The National Service Act created an Air Force separate from the Army and provided for unification of the services under the Department of Defense.*

*4 August 1947. Following legislation which reorganized the Army Medical Service, uniformed psychologists were assigned to the Allied Sciences Section of the Medical Service Corps, and for the first time became part of the permanent (Regular Army) Army Medical Service Organization.*

*October 1947. The Clinical Psychology Branch of the Neuro-psychiatry Consultants Division, Office of The Surgeon General, reestablished with Charles S. Gersoni as chief. This position was later redesignated The Psychology Consultant. Other uniformed psychologists holding this position have been: Frederick A. Zehrer (1951-1954), James W. Layman (1954-1956), Ernest K. Montague (1956-1957), Wendell R. Wilkins (1957-1963), James L. Hedlund (1963-1966), and Charles A. Thomas (1966).*

*May 1949. Army Medical Service Senior Psychology Student Program established to procure 70 Regular Army clinical psychologists and six Regular Army psychophysiological psychologists over the next six years. Clinical psychology internship programs established at Walter Reed General Hospital, Washington, D. C., Fitzsimmons General Hospital, Denver, and Letterman General Hospital, San Francisco.*

## RESEARCH ACHIEVEMENTS AND DIRECTIONS

Building on the research and development dating from 1939 and conducted by the Personnel Research Section at the instance of the Committee on Selection and Training of Aircraft Pilots under the Civil Aeronautics Authority, the Aviation Psychology Program under the leadership of J. C. Flanagan represented effort in several psychological areas. From this point on, research directed at Air Force selection and personnel management, as well as later programs reflecting a more comprehensive approach to human factors problems, was the province of Air Force research elements and is not reported in the present publication.

Responsibilities of the Clinical Psychology Branch have included principally: policy formation and recommendations concerning the qualifications, training, assignment, and utilization of uniformed psychologists (both clinical and experimental) within the Army Medical Service and psychological consultation to staff agencies within the Office of The Surgeon General.

The program permitted direct commissioning of psychology graduate students who were within two years of completing their PhD. Qualified students were brought into active duty and obligated for three years of service following completion of graduate training. After a lapse of two years, the training program was reinstated in similar form in April 1957. In April 1967, the training program was modified to permit up to three years of Army-sponsored graduate training.

## EVENTS AND ORGANIZATIONAL CHANGE

*1947 - 1950. Army Career Guidance Program in effect.*

The Personnel Research Section was assigned responsibility for developing the procedures and instrumentation of a promotion-on-the-basis-of-merit policy.

*November 1948 - January 1949. Induction under Selective Service Act of 1948 (PL 759, 80th Congress, 24 June 1948).*

*January 1949 - August 1950. Volunteers only.*

1949. The Personnel Research Section developed the Army Aptitude Area System of differential classification and its implementation within the Army Personnel System.

## RESEARCH ACHIEVEMENTS AND DIRECTIONS

Tests of technical proficiency were constructed to cover a large number of career fields to determine advancement from grade to grade. When testing as a basis for promotion was suspended in 1950, plans and prototype tests and individual evaluation forms developed by the Personnel Research Section were turned over to the newly formed Enlistment Evaluation Center in Indianapolis, Indiana.

To improve selection and classification, PRS research moved toward the measurement of special abilities needed to perform jobs in different occupational domains. Main reliance was still on cognitive tests. A revised classification test battery, with tests of general and special abilities including Shop Mechanics, Automotive Information, Radio and Electrical Informatic tests, was in use by 1948. It was not until 1949, however, that, under the direction of J. E. Uhlener, initial classification measures were organized into the Aptitude Area System of differential classification. Combinations of from two to four tests valid for groups of Military Occupational Specialties (MOS) constituted the Aptitude Areas.

Approaches to selection for specific programs were characterized by (1) a quantitative rationale for the development of scoring keys for self-description forms using empirical data, (2) rigorous investigation of peer ratings, (3) standardized board interviews, and (4) evaluation forms. Situational tests of leadership were devised to permit quantitative scoring of specified items of behavior rather than more general evaluations.

Early application of psychological research in Army training programs took the form of measuring results. Successive forms of paper-and-pencil and performance tests of achievement in basic military training were developed (1947-1952). Psycho-educational surveys of several Army career schools--OCS, TAG, QM, extension classes of the Engineer School--emphasized determination of the value of the instruction given.

## EVENTS AND ORGANIZATIONAL CHANGE

1949. Human Resources Unit established in the Environmental Protection Section, Research and Development Branch, Military Planning Division, OQMG, with Major Joseph C. Katin, psychologist, head. David R. Peryam, psychologist, appointed chief of the Food Acceptance Branch, Food and Container Institute for the Armed Forces.

1949. Publication of four volumes of The American Soldier, Studies in social psychology in World War II. The four volumes in the series were prepared under the auspices of a Special Committee of the Social Science Research Council comprising Frederick Osborn, Chairman, Leonard S. Cottrell, Jr., Leland C. DeVinney, Carl I. Hovland, John M. Russell, Samuel A. Stouffer, and Donald Young, ex officio, and funded by a grant from the Carnegie Corporation. Institutions and scientists involved in phases of the studies included the Yale Institute of Human Relations (experimental studies conducted by Carl I. Hovland, Frederick D. Sheffield, and Arthur A. Lumsdaine), Cornell University (methodological studies by Louis Guttman and John A. Clausen), Columbia University (analysis and interpretation by Paul F. Lazarsfeld), and the Harvard Laboratory of Social Relations. The four volumes were prepared under the direction of Samuel A. Stouffer.

1 January 1950. The Armed Forces Qualification Test, AFQT-1 and AFQT-2, installed at Main Recruiting Stations.



## RESEARCH ACHIEVEMENTS AND DIRECTIONS

The research program of the Human Resources Unit was approved by a Sub-committee on Psychology in the Quartermaster Corps, Robert E. Seashore, Chairman. The program consisted of human acceptance studies of Quartermaster items, indoctrination and accustomization studies, human engineering studies relating to design of Quartermaster items, and supporting human resources studies on environmental effects. The food acceptance program included in-house and contract research on the psychophysiology of food acceptance, the acceptability of rations and ration items, methodology to support food technology and food research activities, and evaluation of end products, including both rations and menus.

The four volumes of The American Soldier reported an independent analysis and interpretation of data collected during World War II by the Research Branch, War Department I & E Division, from 1941 through 1945, and made available by the War Department. Volume I, The American Soldier; Adjustment during Army life, and Volume II, The American Soldier: Combat and its aftermath, are descriptive of soldiers' attitudes, particularly as seeming to reflect adjustment. Volume III, Experiments in mass communication, analyzes problems in experimental studies in communication, based on Research Branch experience. Volume IV, Measurement and prediction, reviews selected methodological problems including development of conceptual models for ordering respondents along a single continuum.

The Armed Forces Qualification Test, developed jointly by the the services with the Personnel Research Section, Army, as executive agent, was (1) the first psychological test designated for a specific purpose with a mandatory cutting score set by Act of Congress, and (2) the first screening test used by all the services to determine mental fitness.

With the introduction of AFQT, the Recruiting Tests, R-2 and R-3 (the old AGCT 1c and 1d), became pre-screening instruments for use at local recruiting stations. These tests were the forerunners of the present Enlistment Screening Tests developed for the Army by the Personnel Research Section.

## EVENTS AND ORGANIZATIONAL CHANGE

*3 February 1950.* Committee on Human Resources established in the Research and Development Board (OSD level). Early Army representatives included D. E. Baier, H. E. Brogden, Charles S. Gersoni, E. A. Rundquist, and J. E. Uhlauer.

*March 1950.* The Army Participation Group was added to the Navy's Special Devices Center by agreement between the Secretary of the Army and the Secretary of the Navy. The Special Devices Center dates back to 30 April 1944 when it was the Special Devices Desk in the Engineering Division of the Bureau of Aeronautics. The organization was successively upgraded to Section, Division, and Center. In April 1946, the organization moved from Washington, D. C. to Port Washington, New York, and in November 1964 to Orlando, Florida. The Army Participation Group was first under the Continental Army Command and later (1962) under the Army Materiel Command.

*30 June 1950.* Extension of Selective Service Act of 1948 (PL 599--81st Congress). Inductions under the Act began in August 1950.

*2 April 1951.* Qualitative distribution of military manpower instituted in principle.

*19 June 1951.* Percentile score of 10 (standard score, 65) on AFQT established as the minimum acceptable for induction (PL 51, 82d Congress).

*1 July 1951.* System of Armed Forces Examining Stations (AFES) set up consolidating induction functions of the services.

*Mid-1950.* Psychology Department established in the Army Medical Research Laboratory, Fort Knox, by Charles S. Gersoni, then Chief Clinical Psychologist in the Office of The Surgeon General; Robert Y. Walker, Director (1950-1957); Subsequent directors: Arthur J. Riopelle (1957-1959), Ernest K. Montague (1959-1960), Frederick J. Guedry, Jr. (1960-1961), and George S. Harker (1961-1973).

*September 1951.* Environmental Protection Section, Research and Development Division, OQMG, became a branch. John M. McGinnis was the first civilian to head the Human Resources Unit of the Branch.

## RESEARCH ACHIEVEMENTS AND DIRECTIONS

The Armed Forces Qualification Test was the chief instrument for accomplishing the consolidation functions.

The mission of the Psychology Department was to conduct basic research in sensory perception. Army Technical Manual 8-242, Military Clinical Psychology was published by the Department in July 1951. Contributors included David Wechsler, Bruno Klopfer, Henry A. Murray, Starke R. Hathaway, Paul E. Meehl, and Martin Scherer.

Between 1949 and 1951, the Climatic Research Laboratory issued publications based on the survey conducted in 1946 by the Anthropology Branch: Reference Anthropometry of Army Men, Reference Anthropometry of Army Women, and Anthropometric Nomographs.

## PERIOD OF TRANSITION, 1951 TO 1960:

### EVENTS AND ORGANIZATIONAL CHANGE

*1951.* Human Relations and Research Branch established in G-1 (Personnel) to coordinate administration of human resources research in the Army. Colonel Charles W. Hill, Chief of Branch, 1951-1954. The Branch was the forerunner of the present Behavioral Sciences Division of which Colonel C. J. Canella was chief until his retirement 1 March 1968.

*2 August 1951.* Human Resources Research Office (HumRRO) of The George Washington University established. Meredith P. Crawford, Director, 1951 to 1 April 1976 when he was succeeded by Dr. William A. McClelland. HumRRO Division No. 1 (System Operations) was activated in Washington, D. C. as the Training Methods Division, and Division No. 2. (Armor) was activated at Fort Knox, Kentucky as the U.S. Army Armor Human Research Unit, both in 1951. At the same time, Dr. Howard McFarn continued as Vice President of HumRRO and Director of the western Division.

The period was characterized by extension of assistance to military management both in scope and in depth, and by official recognition that human resources research is integral to the Army's research and development program. In the report of the "Harlow" Committee, 1955, these significant statements appear:

"We were especially gratified to see the Army reorganize the management structure for research and development at Department level during the time that the Committee was in existence, and we were pleased that the Human Resources Research Program was integrated into this organization. This move is in a long-range direction which we believe is of primary importance. The effectiveness of integration and coordination of all the Army's human resources research programs is directly related to their involvement with policy matters and with top levels of command, and the management functions of command within the programs are expedited and improved centrally and vitally by movement in the direction taken by the recent reorganization."

#### RESEARCH ACHIEVEMENTS AND DIRECTIONS

An early manifestation of the trend was the concentration of training research in the newly organized HumRRO, which also conducted a research program on motivation, leadership, and morale, and a third program in psychological warfare.

The Training Methods Division of HumRRO conducted research to improve electronics training and maintenance. Emphasis has been given to new approaches in training and maintenance in work units FORECAST, MOSAIC, FICON, JOBTRAIN, LOCKON, NICORD, RADAR, REPAIR, and TRACE.

## EVENTS AND ORGANIZATIONAL CHANGE

1951. A Department of Psychology established in the Walter Reed Army Institute of Research (WRAIR), Washington, D. C. with Joseph V. Brady in charge. Early in 1952, the department was integrated into the newly formed Division of Neuropsychiatry. Over the years, the Division developed into several specialized groups such as the departments of Experimental Psychology, Clinical and Social Psychology, Sensory Psychology, and Experimental Psychophysiology. Prominent research scientists in these groups included John C. Armington, John J. Boren, Martin D. Braine, Robert Galambos, Murray Glanzer, Eliot S. Hearst, Richard Hernstein, Ardie Lubin, Walle Nauta, Edgar H. Schein, Murray Sidman, William Stebbins, and Harold L. Williams.

1951. Project SHOP of the Operations Research Office established in the Johns Hopkins University.

December 1951. Human Engineering Laboratory founded. The Army Human Engineering Conference Report of an ad hoc committee appointed to survey the needs of the Ordnance Corps recommended establishment of a human engineering facility at Aberdeen Proving Ground. The Ordnance Corps Human Engineering activity was formally established in December 1951. Ben Ami Blau was appointed director, with a professional staff of seven. John D. Weisz succeeded Dr. Blau as director in 1957. In 1953, title of the activity was changed to the U. S. Army Ordnance Corps Human Engineering Laboratories.

April 1952. HumRRO Division No. 3 (Recruit Training) activated as the U. S. Army Leadership Human Research Unit, Presidio of Monterey, California.

## RESEARCH ACHIEVEMENTS AND DIRECTIONS

Meantime, other research organizations were formed to deal with segments of human factors research, as military psychologists--and military management--perceived more and more specialized personnel areas and human factors problems which psychological research could help resolve. The period saw the early contributions of the Human Engineering Laboratory, established in 1951, to the design of equipment, resulting in better adjustment to the physique of the human operator and more efficient placement of controls, the achievements of the psychological department of the Army Medical Research Laboratory (AMRL) and the beginnings of operations research in the Operations Research Office.

Extending through a period of over ten years, HumRRO's Work Unit MCO--Research in Support of Training of Potential Non-commissioned Officers--consisted of a survey of Army NCO leadership training and job duties, the development of experimental training programs, and the field evaluation of leadership training programs for light weapons infantry trainees.

## EVENTS AND ORGANIZATIONAL CHANGE

*2 January 1953* The Personnel Research Section became the Personnel Research Branch, Classification and Replacement Division, TAGO. Training research was eliminated from the research program and new programs were added.

*April 1953.* Human Resources Branch formed at the Climatic Research Laboratory, OQMG, Lawrence, Massachusetts, combining the psychological research effort at the Laboratory and the Human Resources Unit. The Climatic Research Laboratory was redesignated the Natick Quartermaster Research Laboratory 1 July and established at Natick, Massachusetts 10 October 1953. In March 1954, the Environmental Protection Division of the Quartermaster Research and Development Command also was transferred to Natick.

*1953.* Lynn Baker appointed Chief Psychologist in the Human Resources Research Branch, G-1.

*1953.* Human Resources Research Branch, U.S. Army Medical Research and Development, Office of The Surgeon General, established to plan, develop, and monitor behavioral science research programs relevant to the Army Medical Service. Monitorship included both in-service (Army Medical Research Laboratory and Walter Reed Army Institute of Research) and extra-mural contract research programs. Charles S. Gersoni was designated the first chief of the Branch (1953-1957). Other psychologists serving in this capacity have included Charles W. Hill (1957-1960), Philip D. Sperling (1960-1962), and James L. Hedlund (1967-1968). There have been several title changes, from Neuropsychiatry and Neurophysiology Research Branch to Behavioral Sciences Research Branch to Biomedical Stress Research Branch (1967).



## RESEARCH ACHIEVEMENTS AND DIRECTIONS

The Personnel Research Branch concentrated on the refinement of methodology for differential classification and intensified experimentation with noncognitive instruments designed to aid in identifying potentially good combat soldiers, for the first time obtaining (in Korea) criterion measures of actual combat behavior. Differential measurement was introduced into the screening area in the form of the Army Qualification Battery. Noncognitive instruments, varying in form but all based on empirically validated keys, were components of package procedures to select likely candidates for Officer Candidate Schools, the Reserve Officer Training Corps, the U. S. Military Academy, and other demanding assignments. The latter part of the decade saw the start of long-term research to predict officer performance differentially in combat, technical, and administrative assignments--a challenge to the "generalist" concept of officer career management.

The program of the Environmental Protection Division gave increased emphasis to the human engineering of Quartermaster items and to psychophysiological research related to environmental protection. Studies were initiated on the acoustic transmission properties of winter headgear and headgear materials, on manual dexterity, and on the encumbering effects of clothing on performance.

## EVENTS AND ORGANIZATIONAL CHANGE

*November 1953.* HumRRO Division No. 4 (Infantry) activated at Fort Benning, Georgia, as the U. S. Army Infantry Human Research Unit.

*July 1954.* HumRRO Division No. 5 (Air Defense) activated at Fort Bliss, Texas. Now the U. S. Army Air Defense Human Research Unit.

*1954.* Army Scientific Advisory Panel, organized as an informal advisory group in 1951, was given official status by the Secretary of the Army in 1954. Among committees formed were those on Personnel and Training (now Human Factors) and on Special Operations (Psychological Warfare). A committee on Management of Research and Development was formed later.

*October 1954.* ASAP ad hoc committee "to review and to advise" on the Human Resources Program of the Army was designated by J. R. Killian, Jr., Chairman, at the request of the Secretary of the Army. Harry F. Harlow served as chairman of the committee.

*January 1955.* Army Human Resources (now Human Factors) Research Advisory Committee (AHFRAC) established under the Chief of Research and Development; charged with evaluating the personnel research program periodically and advising the Office Chief of Research and Development on need for changes in emphasis and levels of efforts "in the interest of a coordinated integrated program."

*February 1955.* First meeting of AHFRAC.

## RESEARCH ACHIEVEMENTS AND DIRECTIONS

Work Unit TRAINFIRE--Experimental Development of Improved Proficiency Tests and Training Methods for Improving the Effectiveness of Combat Riflemen led to the formal adoption by the Army of the TRAINFIRE method of teaching rifle marksmanship including squad sniper and specialist sniper training and squad techniques of rifle fire. Basic tactical squad training was integrated with the firing exercise.

From Work Unit SAMOFF--Systematic Analysis of Training Requirements and Procedures for Surface-to-Air Missile Battery Officers, the objective was realized through the preparation and introduction of a set of training materials on air defense equipment for the Nike-Hercules officer. Programmed and illustrated textbooks were prepared.

## EVENTS AND ORGANIZATIONAL CHANGE

*16 March 1955.* Report of ad hoc Committee on the Army's Human Resources Research Program, Harry F. Harlow, Chairman, submitted to the Secretary of the Army. The report gave express recognition to the shift of control of human factors research activities from G-1 (Personnel) to Research and Development early in 1955, and presaged formation of a separate organization to conduct research for psychological warfare.

*1 September 1955.* Director of Research and Development (now Assistant Secretary of the Army for Research and Development) appointed in the Office of the Secretary of the Army.

*10 October 1955.* Office of the Chief, Research and Development, established. Management of the human resources research program consolidated under the Army Chief of Research and Development.

*November 1955.* Quartermaster Field Evaluation Agency, Fort Lee, Virginia, began activities. Howard W. Hembree, Technical Director.

*1955.* Warren H. Teichner appointed Chief of the Psychology Branch (formerly the Human Resources Branch) of the Environmental Protection Division, CQMG.

*1955.* Human Resources Research Branch transferred from G-1 to R&D. Lynn Baker appointed U. S. Army Chief Psychologist, occupying the position held by T. G. Andrews (1948-49), Harry Harlow (1950-52), and himself (1953-55) when the function was still under G-1.

## RESEARCH ACHIEVEMENTS AND DIRECTIONS

The Harlow report was the clearest evidence that human factors research was accepted as an essential component of research and development. The report was also a potent thrust toward consolidation of the Army's research and development efforts.

The Committee construed the Human Resources Research Program as including "those segments of research and development which utilize primarily psychological and social science research techniques in solving Army problems and in providing bases for the formulation of procedures and policy. By way of contrast with other Army research and development programs which have as their objective the improvement of the Army's operational capability and efficiency through the development of more effective equipment or better operational plans, the human resources programs seek improvement for the Army by focusing research attention on the soldier as an individual, as a unit member, or as an element of a man-machine system. . . ."

Mission of the Agency included some soldier preference studies in addition to field evaluation studies. Research was both in-house and contract.

## EVENTS AND ORGANIZATIONAL CHANGE

*14 - 15 December 1955.* First Army Human Engineering Conference held under the sponsorship of the Chief of Research and Development, Office Chief of Staff, Department of the Army. By October 1957, title of the Conference had been changed to the Annual Army Human Factors Engineering Conference. Not until 1963 did it become the Annual Army Human Factors Research and Development Conference.

*17 April 1956.* The Special Operations Research Office (SORO) established to conduct research in the relatively unexplored field of special warfare, to include psychological operations, guerrilla warfare, escape and evasion, and counterinsurgency. While administratively a part of The American University, the new research organization was to be responsible to the Chief of Psychological Warfare. By FY 1958, SORO had expanded to four research teams. In July 1958, SORO took over the Washington office of the Human Relations Area Files, a research organization in New Haven, Connecticut. The newly acquired activity became the Foreign Areas Studies Division (FASD) of SORO. The SORO research teams became the Research Division. SORO was later renamed the Center for Research in Social Systems (GRESS). Kai E. Rasmussen, Director 1956-1962; Theodore R. Vallance, Director 1962-1966; and Preston S. Abbott, Director 1967 to 1968.

*July 1956.* HumRRO Division No. 6 (Aviation) activated at Fort Rucker, Alabama, as the U. S. Army Aviation Research Detachment of the Training Methods Division, later becoming the U. S. Army Aviation Human Research Unit.

## RESEARCH ACHIEVEMENTS AND DIRECTIONS

These conferences--the 1967 Conference was the thirteenth--bring together diverse elements of the Army's human factors research and development activities and stimulate the direct interchange of information on ongoing and planned research. Each conference report is an authoritative compendium of current work programs in areas of human factors research for the Army as well as of the papers presented. Dr. Lynn Baker, Chief Psychologist for the Army, conceived the idea of the annual conference and has been mainly responsible for maintaining the activity at a high level of interest and increasingly broadened participation.

"Mass Defection," a representative early SORO project, was a study of factors other than battle stress which contribute to large-scale defections of combat forces. Captured German war records dealing with Soviet Army defection in World War II provided the basis for clues to strategies and tactical measures that might be taken to promote mass defections of enemy forces. Mass communications in eastern Europe was the subject of an eight-volume study prepared in 1958. Several columns on word-of-mouth communications in different countries were prepared between 1961 and 1964. A casebook and a series of case studies in insurgency and revolutionary warfare were completed between 1962 and 1964.

Under Work Unit LIFT, Army Aviation Helicopter Pilot Training concepts and principles of quality control were applied to the flight training course at the U. S. Army Primary Helicopter School at Fort Wolters, Texas. A systematic evaluation of student check rides at two levels of proficiency during training was inaugurated.

## EVENTS AND ORGANIZATIONAL CHANGE

*1 January 1957. Quartermaster Research and Development Laboratories redesignated the Quartermaster Research and Engineering Center Laboratories of the Quartermaster Research and Engineering Command. The Environmental Protection Division became the Environmental Protection Research Division of the Laboratories. E. Ralph Dusek became chief of the Psychology Branch in September 1957. A series of Human Engineering Handbooks was initiated. Human engineering compatibility studies were initiated on Quartermaster clothing and personal equipment used with military systems undergoing simulated arctic environmental tests at the Eglin Air Force Base Climatic Laboratories and elsewhere. Anthropologists of the Environmental Protection Research Division published anthropometric analyses of handwear, footwear, headgear, and dress and field clothing. In 1959, an anthropometric survey of Army aviators was conducted.*

*1957. Formal adoption by the Army of TRAINFIRE method of teaching rifle marksmanship developed by HumRRO, with publication of FM 23-71 and 23-72.*

*August 1957. U. S. Army Research and Development Field Office established at Fort Belvoir, Virginia.*

*24 March 1958. The U. S. Army Research and Development Field Office became the Army Research Office and moved to Arlington Hall, Virginia. The Human Factors Research Division was organized to assist in planning and coordination of the Army's research program.*



## RESEARCH ACHIEVEMENTS AND DIRECTIONS

Contract research was initiated on the nature and extent of functional conflicts between Quartermaster clothing and equipment and equipment developed by the other technical services. The Human Engineering Handbooks showed the dimensions of the 5th and 95th percentile soldier, wearing standard Army cold weather clothing, in various positions. In addition to psychophysiological studies of environmental clothing, human factors engineering research was initiated on dexterity requirements of the Nike A missile and on special protective clothing used for fueling missiles. Studies were conducted by the Environmental Protection Research Division on human factors to be considered in developing protective devices for Army aviators. Human factors studies were initiated of cold weather head and face protective devices and of thermal protective masks. Studies were also initiated on the effects of ambient temperature, skin temperature, internal body temperature, and the effects of hand cooling and body cooling on manual performance.

This was the first of a series of major training innovations based on human factors research. Within HumRRO, concern with utilization led to the concept of the Technical Advisory Service and the realization that engineering of research findings for actual use often requires more effort than the research itself.

The time was ripe for organizational change that would permit expansion in research and development beyond the confines of separate fractionated missions. Each research agency, while continuing to anchor its activities at the separate mission accorded it through precedent and the presence of specialized personnel capabilities, would also be enlarged to include more integrated human factors solutions to the Army missions with which it was concerned.

# DEVELOPMENTS, 1960 TO 1969

## EVENTS AND ORGANIZATIONAL CHANGE

*25 - 27 May 1960. Tri-Service Conference on Selection Research, Pensacola, Florida.*

*1 May 1961. Office, Director of Army Research established under Office, Chief of Research and Development.*

The beginning of the period was marked by reaction to compartmentalism, by recognition that it is impossible to conduct sound studies within designated problem areas such as selection, classification, training, and human engineering without due regard for factors operating in other areas. Human factors scientists in research organizations found themselves compelled, in the interest of valid products, to pursue their investigations beyond the confines of separate fractionated missions and to look at a problem in its totality.

#### RESEARCH ACHIEVEMENTS AND DIRECTIONS

The lead-off paper "Systems Research--Opportunity and Challenge for the Measurement Research Psychologist," by J. E. Uhlmer, presented a systems oriented approach to human factors problems in the Army. Sidney Friedman, reviewing highlights of the conference, noted indications that selection research per se was no longer a neat well-defined area to which psychological research could profitably be confined. Concern with mathematical models of personnel selection systems was notable in a paper by J. H. Ward, Jr. and F. B. Ford, and in one by Albert Glickman.

## EVENTS AND ORGANIZATIONAL CHANGE

*1 July 1961.* U. S. Army Research Institute of Environmental Medicine formed at Natick, Massachusetts (DA General Orders No. 33, 21 September 1961).

*December 1961.* Social Science Branch established in the Human Factors Research Division, Office, Chief of Research and Development.

*3 December 1961.* The U. S. Army Personnel Research Office (US APRO), heretofore administratively in the Research and Development Command of The Adjutant General's Department, became a Class II activity of the Office, Chief of Research and Development (General Orders No. 44, November 1961).

## RESEARCH ACHIEVEMENTS AND DIRECTIONS

Formation of ARIEM marked the beginning of psychological research on human performance under extreme environmental conditions. The Institute was formed from elements of the Medical Research and Development Command at Fort Knox, Kentucky, and of the Psychology Branch of the Environmental Protection Research Division doing research in environmental medicine. Initial psychological staff: R. Ernest Clark, Bernard J. Fine, Donald R. Sweeny. The human engineering, anthropology, and food acceptance sections remained with the Quartermaster organization and later became the nucleus of the present AMC effort in human factors research at Natick. The Psychology Branch was redesignated the Engineering Psychology Laboratory and transferred to the Pioneering Research Division, Quartermaster Research and Engineering Command. Certain functions of the Anthropology Branch--anthropometry, sizing, tariffs, research--were assigned to the Engineering Psychology Laboratories.

Establishment of the Branch was in recognition of the growing importance of the social sciences in the Army's mission.

The changed position of US APRO furthered efforts to develop a program of research on human performance and manned systems. Research programs hinging on the empirical measurement of systems effectiveness were established in the Support Systems Research Division of APRO--notably in command and control, image interpretation, and information systems. The appointment of Philip J. Bersh as Chief of the Combat Systems Research Division strengthened development of a methodology of human performance experimentation in a systems setting. Early exercise was in research on vigilance behavior and voice-radio communications. Developments in computerized optimal allocation were the logical outcome of research begun as far back as 1946 by Brogden and Dwyer. Current effort in this direction is on the development of optimization models for manpower operations research.

## EVENTS AND ORGANIZATIONAL CHANGE

1961. First annual issue of CONARC Pamphlet on Utilization of HumRRO Research.

26 - 28 March 1962. Symposium, "The U. S. Army's Limited War Mission and Social Science Research" held in Washington, D. C. under sponsorship of the Chief of Research and Development.

July 1962. Following the reorganization of the Army, the Ordnance Corps Human Engineering Laboratories were designated the U. S. Army Human Engineering Laboratories, reporting to the Commanding General, U. S. Army Materiel Command (General Orders No. 46, 25 July 1962). Concurrently, human engineering groups were established in each of the subordinate commands of the AMC.

13 November 1962. The U. S. Army Quartermaster Research and Engineering Center was renamed the Natick Laboratories (General Orders No. 27, Hq, Department of the Army).

April 1963. HumRRO Division No. 7 (Language and Area Training) was activated in Alexandria, Virginia as the Language and Area Training Division.

## RESEARCH ACHIEVEMENTS AND DIRECTIONS

Publication was the first systematic attempt by an Army agency to record instances of utilization of research. The series of pamphlets encouraged additional utilization of HumRRO research.

Objectives of the symposium were (1) to present a clear picture of the Army's limited war mission, with special emphasis on its counterinsurgency mission, (2) to identify the Army's requirements for behavioral and social science research and to stimulate the interest of members of the behavioral and social science community in the Army's research and development programs, and (3) to promote understanding of the Army's research and development efforts and coordination with other government agencies and departments having interest in counterinsurgency problems.

An integrated program was developed for self-instructional foreign language training and techniques in cross-cultural training of personnel assigned to duties in developing countries. The Army and other services have adopted the self-instructional course in Vietnamese.

## EVENTS AND ORGANIZATIONAL CHANGE

*1 July 1963.* Special Operations Field Office (SORFO) activated at Fort Bragg as an element of SORO.

*30 August 1963.* The Quartermaster Food and Container Institute for the Armed Forces discontinued. Functions transferred to the Natick Laboratories, Natick, Massachusetts (DA General Orders No. 58, 28 August 1963). The Food Acceptance Division was also transferred to the Natick Laboratories, becoming part of the Engineering Psychology Laboratories, Pioneering Division.

*1963.* HumRRO Work Program organized into ten functional areas: Equipment Maintenance, Equipment Operation, Individual Combat Skills, Team Combat Skills, Leadership, Decision Making, Motivation and Stress, Remote Area Operations and Language, Training Management, Training Technology.



## RESEARCH ACHIEVEMENTS AND DIRECTIONS

The major initial project of SORFO was the discovery and elucidation of requirements for non-materiel research in support of the mission of the Special Warfare Center and School. The staff directed its efforts to the immediate needs of the installations, as well as to those of the Combat Developments Agency. SORFO also served as liaison between the Army agencies at Fort Bragg and various human factors research agencies.

While only a few of the personnel of the Food Acceptance Division moved from Chicago to Natick and none remained for more than a year, food acceptance research continued under new personnel at Natick.

A new report, Reference Anthropometry of the Arctic Equipped Soldier, replaced for most purposes the Human Engineering Handbooks as a source for the body dimensions of the soldier wearing standard Army Arctic clothing. Cold weather compatibility studies, studies of effects of body cooling on arm steadiness and other measures, tropic studies, and anthropometric and human engineering studies of body armor continued through 1965. In 1966, anthropometric surveys of the U. S. armed forces were conducted, and body size data were obtained of samples of Army, Navy, Marine Corps, and Air Force personnel. A basic research program on thirst, appetite, taste, and smell was initiated, using both animal and human subjects.

The reorganization represented a systems-oriented outlook, particularly in training research areas. Initiated during FY 1967, Work Unit TRAINMAN--Development of an Instructional Program in Training Technology and Training Management, gave special attention to advances and new concepts in training technology and management.

## EVENTS AND ORGANIZATIONAL CHANGE

*March 1964.* SORO element of the Human Factors and Operations Research Unit, Korea, instituted.

*1 July 1964.* The Counterinsurgency Information Analysis Center, later renamed the Cultural Information Analysis Center (CINFAC), became operational within CRESS.

*1966.* U. S. Army Research Institute of Environmental Medicine reorganized. The Behavioral Sciences Laboratory was formed as one of five laboratories with a total staff of 35. E. Ralph Dusek, Director.

## RESEARCH ACHIEVEMENTS AND DIRECTIONS

The SORO Korea unit's research on cross-cultural problems began with the gathering of data on community relations advisory councils and on the cross-cultural relationships between United States military personnel and the military personnel of other countries.

CINFAC's information processing services supplemented those provided by the parent organization (SORO, later CRESS) in a program of cross-cultural research. An extensive informational base was accumulated and an aggregation of research and analytical expertise developed on problems of internal defense, socioeconomic development, and rapid social and cultural change. On a rapid-response basis, CINFAC provided the Department of Defense and related agencies with information, analyses, and syntheses of data pertaining to human factors involved in the processes of modernization and social change in specific geographical areas.

Between 1960 and 1965, SORO published bibliographies in three areas--psychological operations, counterinsurgency, and unconventional warfare. These volumes were kept up to date by CINFAC's Bibliographic Service Branch.

The laboratories at Natick are concerned with the effects of heat, cold, work and fatigue, and high terrestrial elevations (hypoxia) on the performance of soldiers. In addition, drugs which may alleviate or prevent the worst effects of such environmental factors on soldiers are studied. In studies of basic mechanisms involved in reactions to extreme environments, animals may be the preferred subjects for initial experimentation.

## EVENTS AND ORGANIZATIONAL CHANGE

*1 July 1966.* The Center for Research in Social Systems (CRESS) was established as successor to the Special Operations Research Office (SORO). The Foreign Areas Studies Division became an administratively independent entity under contract to the Department of the Army.

*1 March 1967.* The U. S. Army Personnel Research Office, OCRD, became the U. S. Army Behavioral Science Research Laboratory (BESRL) (General Orders No. 11, 6 March 1967), a name changed to U. S. Army Behavior and Systems Research Laboratory in December 1969.

*30 April 1967.* The Psychology Branch, Pioneering Research Laboratory, U. S. Army Natick Laboratories, became the Behavioral Sciences Division.

## RESEARCH ACHIEVEMENTS AND DIRECTIONS

The CRESS program of basic and applied research fell conceptually into problem areas: (1) cross-cultural communications, (2) orientation and adaptation of personnel to foreign cultures, (3) measurement of the effectiveness of United States overseas program, (4) military roles in socioeconomic development and political change, and (5) methodologies for the study of foreign cultures.

The new designations gave recognition to the broader compass of the research programs.

## 1969 TO THE PRESENT

### EVENTS AND ORGANIZATIONAL CHANGE

*21 February 1969.* Policy statement issued by the Federal Council for Science and Technology and approved by The President, directing federal agencies and federally-supported research centers to make research equipment and facilities more readily available to qualified university investigators.

*December 1969.* The U.S. Army Manpower Resources Research Center and the U.S. Army Motivation and Training Laboratory were established.

## RESEARCH ACHIEVEMENTS AND DIRECTIONS

The practice was designed to foster closer and at the same time more extensive cooperation within the total national scientific community, governmental and civilian. To stimulate research proposals from non-profit investigators, a program of distributing "Themes"--broad areas in which advances in scientific theory and knowledge, methods, and state-of-the-art are needed--was inaugurated. A "Themes" brochure is published annually, by the US Army Behavioral and Systems Research Laboratory (BESRL) until 1972, then by the US Army Research Institute for the Behavioral and Social Sciences (ARI). The brochure lists suggested areas for basic research on which innovative approaches and new theoretical constructs directly or indirectly relevant to Army problems are desired.

The mission of the new laboratory was to augment the research of the US Army Behavior and Systems Research Laboratory by conducting research in two major areas: (1) Motivation, to include motivation, morale, leadership, and values of the American soldier--race relations, drug abuse, social change, soldier-community relations, and career incentive problems; and (2) Training, the improvement of efficiency and effectiveness of training and operational performance of military personnel and units and the efficient acquisition of required military knowledges and skills, procedures to insure retention of required knowledges and skills, and ways to maximize these in performing military duties.

## EVENTS AND ORGANIZATIONAL CHANGE

*10 February 1970 - June 1971.* The Manpower Research Task Force, Defense Science Board, ordered convened by the Director, Defense and Engineering. The Task Force was charged with identifying issues the Armed Forces are likely to encounter in manpower and personnel planning in the 70s. Mandatory areas of inquiry were the impact of the change to an all-volunteer force with accompanying shifts in skill composition, racial mix, and educational level, adjustment to reduced personnel ceilings, and adjustment to changes in strategic guidance (including recruitment, retention, rotation policies). An additional requirement was to assess the DoD research capabilities to meet these changes. The Task Force, chaired by Dr. Eli Ginsberg of Columbia University, issued its report in June 1971.

*Early 1970s.* The US Army Manpower Resources Research Center (MTL) initiated a study of the American soldier in the 70s, concerned with problems of young persons coming into the Army. The study is continued on a reduced scale in the contemporary issues development program (1977) of the US Army Research Institute for the Behavioral and Social Sciences.

*1971.* Dr. U. E. Uhlener was designated The Chief Psychologist of the US Army.



## RESEARCH ACHIEVEMENTS AND DIRECTIONS

Major results stemming directly or in part from the report were (1) enhancement of the role of the social and behavioral sciences in military psychological research, (2) substantial increase in studies in the socio-psychological area, (3) greater centralization of direction, (4) broader recruitment of scientists across human sciences disciplines and more interchange of information and ideas with the civilian and scientific community, (5) closer ties between manpower research and manpower management in the services, and (6) expansion of the research program toward "macro" manpower studies on matters of concern to the total military establishment and having impact on policy decisions at high levels, as distinguished from "micro" studies responsive to the needs of operational elements.

The study recalls The American Soldier, the four-volume series published in 1949 on a study of the attitudes and adjustment of World War II soldiers, conducted under the direction of Samuel A. Stouffer. Included in the present longitudinal program are problems associated with minority groups, social adjustment to a military environment, and the transition to an all-volunteer force. As a result of the early phases of the program, several hours of training in race relations have been included in the basic training curriculum.

## EVENTS AND ORGANIZATIONAL CHANGE

*October 1972.* The U.S. Army Research Institute for the Behavioral and Social Sciences was activated by General Order No. 30, OCRD, DA to replace the U.S. Army Manpower Resources R and D Center, the U.S. Army Motivation and Training Research Laboratory, and the U.S. Army Behavior and Systems Research Laboratory, being given in addition a variety of missions and functions previously carried out by the Army Research Office in Arlington, Virginia. The Army Research Institute (ARI) is a field operating agency and a developing agency for the RDTE human resources research program.

*October 1972.* The Individual Training and Performance Research Laboratory (ITPRL) was organized as one of the two major elements in the US Army Research Institute.

## RESEARCH ACHIEVEMENTS AND DIRECTIONS

The U.S. Army Research Institute for the Behavioral and Social Sciences has become the developing agency for the social sciences in the Army. Its mission includes scientific and technology basic research for the Army and a program of applied research and advanced development. ARI seeks to promote maximum levels of military and civilian personnel performance throughout the Army, to support the effective operation of current and future combat and tactical systems, and to maintain the proficiency of groups of individuals working as teams. To the Army user of behavioral and social science research products, ARI can be looked upon as the embodiment of the long-recognized need to examine and be responsive to the totality of a soldier's passage through the Army.

The ITPRI conducts experimental development in the areas of personnel selection, classification, training, and career management; leadership; psychosocial adjustment of soldiers to the Army; quality of life in the Army; motivation, morale, and job satisfaction, the role of women in the Army and the impact of their positions on individual and unit accomplishment. Typical accomplishments of the Individual Training and Performance Research Laboratory are the introduction of a new Army Classification Battery for operational use; procedures and materials for training and evaluating Army instructors in order to improve their classroom effectiveness; publication of a resource book for use by Race Relations/Equal Opportunity program staff; improved reliability of techniques for sampling soldier attitudes and behavior; systems engineering of leadership training for Infantry officer candidates; and development of personnel management models to include relationship of retention to tour length and required systems to support rotation policies.

## EVENTS AND ORGANIZATIONAL CHANGE

*October 1972.* The Organization and Systems Research Laboratory (OSRL) was organized as one of the two major elements in the restructured Army Research Institute, parallel to the Individual Training and Performance Laboratory (ITPRL).

*1972 - 30 June 1975.* The Human Resources Research Organization (HumRRO) was deactivated as a Federal Contract Research Center over a three-year period ending 30 June 1975. HumRRO field installations became a part of the centralized behavioral and social sciences research program conducted by the Army Research Institute for the Behavioral and Social Sciences.

*1972.* Revised forms of the Armed Services Vocational Aptitude Battery (ASVAB-2 and -3) replaced ASVAB -1 in high schools nation-wide for screening and counseling potential enlistees.

## RESEARCH ACHIEVEMENTS AND DIRECTIONS

OSRL conducts research to enhance the effectiveness of groups of individuals in supporting command and control functions and in systems integration through measurement of total systems performance.

Typical recent accomplishments of the Organization and Systems Research Laboratory include a specialized data language which, when combined with a touch-sensitive input device, has proved to be a feasible means of inputting messages from forward observers and other front line troops; completion of a system design for the operational computerized training system using a small scale modularized computer system; determination of major factors influencing proficiency of personnel in nap-of-the-earth flight and night flying, development of a handbook for unit training managers and a program of instruction on how to conduct unit training more effectively, both tested at the U.S. Army Infantry School; utilization of a U.S. Army Security Agency test bed for identifying critical problem areas in the design of a pilot organizational development program; development of a Situational Training Model (STM) to improve training in small units by making it more realistic, e.g., involving tactical skills related to survival and an element of competition.

Much of the research activity that had been conducted by HumRRO in its FCRC status as a research organization with on-post units conducting projects in an operational setting was transferred to the newly expanded U.S. Army Research Institute. HumRRO converted to a private contracting institution.

The Army has been the lead service in developing the ASVAB. The test was used as a single screening instrument for applicants for enlistment in all the services, saving time and effort spent in later testing at AFES of applicants unlikely to qualify for service. The ASVAB also provided information useful to vocational counselors in high schools. ASVAB-1 was introduced in September 1968, Forms 2 and 3 on 1 January 1973 after validation and standardization by the Army Research Institute in cooperation with military and civilian personnel of the other services. The ASVAB replaced the Army Classification Battery ACB-3 for Army recruits as well as instruments previously used by the Navy and Air Force.

The Air Force was lead service in developing ASVAB-5, used in high schools, and ASVAB-6 and -7, introduced operationally 1 January 1976, replacing all previous selection tests used at Armed Forces Examining and Entrance Stations.

## EVENTS AND ORGANIZATIONAL CHANGE

*Fall 1972.* US Army Research Institute Field Units were established at Fort Benning where an Assessment Center was established at the Infantry School to assist in the leadership development of commissioned and noncommissioned officers and in the final selection of officer candidates, and at Fort Ord, where, among other tasks, a prototype performance-based system of training for combat is being developed.

## RESEARCH ACHIEVEMENTS AND DIRECTIONS

At Fort Benning, the Army established a pilot Assessment Center to test the applicability of the concept for improving individual motivation and unit effectiveness. The Center completed its mission in December 1974, and the Army Research Institute assumed responsibility for the follow-up study to provide validation of the assessment center concept as applied to junior officer and enlisted personnel.

The Field Unit centers its research efforts on the application of behavioral science to problems of combat effectiveness in the Army's Infantry units. A project on the development of cost effective methods for collective training in infantry seeks innovative revisions in institutional and unit training for individual weapons systems. Both training programs and evaluation procedures are performance oriented, criterion (combat) referenced, and hierarchically programmed where appropriate.

The Fort Ord ARI Field Unit conducts research in a number of widely differing areas including performance-based extension training for the Combat Arms, literacy training and training of low ability personnel, field assessment of training doctrine, and combat development research using engagement simulation techniques REALTRAIN and EFFTRAIN.

A performance-based individual training system has been developed that can be put in operation while individuals are assigned to units rather than to Army schools. The materials are designed to be administered in integrated task training packages or modules and end-of-module performance tests.

In the area of contemporary issues affecting Army personnel, the Field Unit is concerned with the evaluation of current and experimental programs to improve race and ethnic relations in the Army and with monitoring the impact of selected intervention strategies to improve morale in units, increase effectiveness, and promote retention of qualified Army personnel. ARI scientists have developed a system for measuring institutional racial discrimination at Department of the Army, battalion, brigade, and division level. A study concerning institutional bias toward women in the Army is included.

## EVENTS AND ORGANIZATIONAL CHANGE

*Fall 1972.* Field experimentation units were established at Fort Hood, where research scientists assist in evaluating and devising methods of improving performance on complex weapons and surveillance systems, and in the USAREUR where field research is conducted in support of combat readiness and maintenance installations.

*November 1972.* Unit Training and Educational Technology Systems was established as a Technical Area in the Army Research Institute



## RESEARCH ACHIEVEMENTS AND DIRECTIONS

The ARI field unit at Heidelberg, Germany, assists the Army Research Institute Technical Areas in identifying Army problems noted or likely to occur in the European Theater and participates in the conduct of field research.

In FY 1970, The Army Research Institute initiated formative evaluation of organizational effectiveness techniques in the USAREUR. Organizational Effectiveness (OE), a structured program to further the efficiency, productivity, and job satisfaction of units, combines diagnostic surveys with immediate feedback to company commanders. The early phase of the research has provided some empirical basis for understanding personnel and system-related problems of soldiers entering the USAREUR and for introducing modifications in orientation procedures.

In support of research on performance in field assessment, the Fort Hood Field Unit has initiated the development of measures of effectiveness for the development and evaluation of weapons systems, units, crews, and training programs. For example, tanks or trucks tested in an operational environment bring into play human factors and training aspects not operating in laboratory tests. These factors are identified and standards established to enable valid comparisons of the systems, crews, and units being evaluated.

In related efforts, research has been undertaken to improve personnel selection and training for command and control systems. Problems of man-machine interface are identified. Target acquisition techniques and the utility of mnemonic techniques in tasks requiring divided attention to a number of stimuli are being examined.

Within this area, The Army Research Institute developed a technique in which combat skills were inculcated through application of principles of behavioral science within a realistic, competitive, low-cost simulation. Refinement of the procedures has produced training systems applicable to infantry and other combat units, notably EFFTRAIN, a combination of a two-sided board game based on abstractions from troop training exercises and a two-sided freeplay tactical exercise without troops. In terms of casualties inflicted (realistically computed) during these training engagements, EFFTRAIN appears to be a useful method for training junior leaders to make appropriate tactical decisions and take appropriate action, while using a minimum of troop and equipment support.

## EVENTS AND ORGANIZATIONAL CHANGE

*November 1972.* The Social Processes Technical Area was established as a major area of research in the Army Research Institute, and continued until 1973.

*December 1972.* The Military Requirements and Product Utilization Office was formed within the Army Research Institute to further assist in coupling activities in the Technical Areas and sponsor-users of the results of ARI research. The staff, all military officers, performed liaison activities.

*1972 - 1973.* Army policy directed the assignment of women to training and operational units of all kinds except those associated with combat or close combat support.

## RESEARCH ACHIEVEMENTS AND DIRECTIONS

The Social Processes Technical Area addressed the issues of societal change affecting individual soldiers and the Army as a whole. Research sought to increase the individual's capacity to resolve problems associated with morale and discipline, racial disharmony, youth rebellion and dissidence, adjustment to the Army environment, and the prevention of drug abuse.

In the limited period of its existence, the Social Processes Technical Area succeeded in establishing some principles useful to the understanding of contemporary problems, and progress was made in developing a system of social indicators that would provide useful statistics to decision makers in the area. In 1973, ARI developed the Racial Attitudes and Perceptions Survey for use of commanders in assessing the racial climate in their installations. DA Pamphlet 6.0016, Improving Race Relations in the Army, is used by the National Guard Bureau and Reserve Components.

Mission of the Office was to help define needs and problems and to promote the adoption and effective use of the research products.

The changing policy led to intensification of research on the role of women in the Army and the initiation of programs to assess the influence of various situational factors on the job productivity and career development of women soldiers, as well as the impact of enlisted women and officers on the morale and effectiveness of units to which both men and women are assigned. Programs are also under way on the appropriateness of standards and course content in training and operational units composed of male and female officers and enlisted personnel. Included are problems connected with institutional bias and social difficulties accompanying the relations between the sexes in competing roles.

## EVENTS AND ORGANIZATIONAL CHANGE

*1 July 1973.* The US Army Training and Doctrine Command (TRADOC) was established as the major command incorporating all aspects of training and combat development formerly conducted under the Continental Army Command (CCNARC) and the Combat Developments Command (CDC).

*8 May 1974.* The U.S. Army Research Institute for the Behavioral and Social Sciences was transferred organizationally from OCRD to become a field operating agency under the jurisdiction of the Deputy Chief of Staff for Personnel, by General Order No. 10.

*July 1974.* Individual Training and Performance Evaluation Technical Area established in the US Army Research Institute.

## RESEARCH ACHIEVEMENTS AND DIRECTIONS

TRADOC is responsible for conducting institutional training, developing training doctrine, and providing support for unit training (as outlined in Army Regulations) specifically AR 10-41 (title: United States Army Training and Doctrine Command).

TRADOC is the primary user of research products of basic research, exploratory development, and advanced development.

Institutional training is designed primarily to provide individual training at Army service schools and training centers, US Army Reserve schools, and NCO academies. Individual training in these institutions supports the Enlisted Personnel Management System, Basic Combat Training/Basic Training required of each person entering the Army, Advanced individual training leading to the award of a Military Occupational Specialty, the noncommissioned officer educational system, a self-study program, and the Officer Personnel Management System, designed to prepare officers for progressively higher positions or enhance their skills for specific duty assignments.

Unit training consists primarily of collective training to prepare crews, teams, and squads for required group tasks. Included are operational readiness training and evaluation, field training exercises under simulated combat conditions, and activation training of newly organized elements.

Research in individual training has developed performance-oriented training, Skill Qualification Tests (SQT) which provide basis for judging whether a soldier can perform well or adequately on the job and techniques for training instructors in use of new types of training and evaluation. Such techniques provide more efficient and effective training to individuals and are designed to develop more competent soldiers.

## EVENTS AND ORGANIZATIONAL CHANGE

*July 1974.* Field Units of the Army Research Institute were established at Forts Bliss, Knox, Rucker, and Leavenworth, and in Korea (Far East ARI Field Unit), joining the previously established units at Forts Benning, Ord, Hood, and in the USAREUR.

*Spring 1975.* The approved FY 1976 Work Program specified substantial reduction in funding for certain social science areas, notably in certain research activities of the Social Processes Technical Area of the Army Research Institute.

*June 1975.* The Educational Technology and Training Simulation Technical Area was established as a major research area in the Army Research Institute.

## RESEARCH ACHIEVEMENTS AND DIRECTIONS

ARI Field Units have the capability to adapt and develop research with demonstrations of the feasibility of the research and of emerging products. They conduct assigned portions of ARI's work program in support of the overall research and development program in the behavioral and social sciences, stressing solutions to operational problems--and evolution of the problems themselves--in realistic settings.

ARI Field Unit personnel provide technical advisory service to local commanders; advise and assist installation staff in developing research requirements; coordinate troop support requirements at a local level, assist in implementing research and determine the nature and extent of utilization of research products.

Eliminated were research on the prevention of drug abuse and special psychological operations for the volunteer Army. Limited research activity was authorized on problems of race relations and studies in the longitudinal project on the Soldier of the 70s.

Developments in computer technology have opened new possibilities of computer-assisted instruction (CAI) for many areas of Army training. One of the potentially most important is the concept of using a simulated tactical operations system (SIMTOS) computer to train the user in how to use the device itself--embedded training. The Educational Technology research explores means of best developing and using these techniques.

## EVENTS AND ORGANIZATIONAL CHANGE

*1 June 1975.* Army Regulation AR 70-1, Research and Development, Army Research, Development, and Acquisition, issued 1 May 1975 and effective 1 June 1975, allocated responsibility for the Army's various research and development programs.

*1 December 1976.* Army Regulation 70-8, Research and Development, Army Research Development, and Acquisition, Personnel Performance and Training Program, issued 28 October 1976 and effective 1 December 1976, incorporated major revisions both in title and in operational and scientific goals.



## RESEARCH ACHIEVEMENTS AND DIRECTIONS

The AR states the responsibility of the U.S. Army Research Institute for the Behavioral and Social Sciences in these terms:

"The organization is responsible for supervising and conducting behavioral sciences R and D relevant to Army interests in manned systems, human performance, social processes, and personnel management. This responsibility includes, but is not limited to, relevant R and D on assessment of quantitative and qualitative manpower resources and requirements for personnel accession and distribution; systems for individual and unit training; motivation, morale, leadership, and values of the American soldier; internal defense, civil actions, military assistance, and psychological operations; and human factors affecting military operations."

ARs 70-1 and 70-2 brought together and affirmed many of the changes that had been in process in the preceding years, accompanying the reorganization of the total military research program and centralization of the behavioral and social science research in the Army Research Institute. This centralization, set in motion at the beginning of the 70s, has been achieved by placing responsibility for the structure and funding of the human performance portion of RDTE in the Deputy Chief of Staff for Personnel (DCSPER). The program is executed through two developing agencies, the US Army Research Institute (ARI) and the US Army Materiel Development and Readiness Command (DARCOM). ARI's responsibility is as stated in the entry for AR 70-1.

Inclusion of advanced development in ARI's area of responsibility has led to improvement in the interface between technology and its application for the use of manpower management.

In the case of nonmateriel technology, advanced development (designated 6.3A) refers to research which has potential application to a variety of similar generic end products rather than to one specific system.

Human Research Need statements, the instruments by which requirements of sponsors have been fed into the annual research Work Program, are now considered advisory rather than mandatory. They are included in supporting documentation bearing on a proposed research project for consideration as part of the ensuing program.

## EVENTS AND ORGANIZATIONAL CHANGE

1976. Natick Laboratories, Natick, Mass. Centralization of the activities of the various Natick Laboratories (begun in 1962 when the US Army Quartermaster Research and Engineering Center was renamed the Natick Laboratories) continued. The organization is now the US Army Natick Research and Development Command (NARADCOM). The Technical Director is Dr. Dale Sieling.

1976. The Army Research Institute of Environmental Medicine (ARIEM), at Natick, Mass., having undergone substantial reorganization, is now part of The Surgeon General's Office under the US Medical Research and Development Command. Dr. John L. Cobrick heads the research activities of the organization which is located at the Natick Laboratories.

1976. The US Army Human Engineering Laboratory (HEL)--Current status. In the 1976 reorganization of Army research activities, the Human Engineering Laboratory continued as a separate entity at Aberdeen Proving Ground, Maryland, reporting directly to the Deputy Commanding General of Materiel Acquisition, US Army Materiel Development and Readiness Command (DARCOM). The present director is Dr. John D. Weisz.

Much of the organization's activity is channeled through field representation in human engineering groups at various subcommands of DARCOM: including the US Army Tank Research and Development Command, Warren, Mich. (TARADCOM); The US Army Armament R&D Command, Dover, N.J. (ARRADCOM); the US Army Mobility Equipment R&D Command, Ft. Belvoir (MERADCOM); the US Army Aviation R&D Command, St. Louis, Mo. (AVRADCOM); the Co-Regions Test Center, Greeley, Alaska (CRTC); the US Army Missile R&D Command, Huntsville, Ala. (MIRADCOM); the US Army Materiel Systems Analysis Activity (AMSAA) Aberdeen Proving Ground; and the Edgewood, Rock Island, and Picatinny Arsenals.

## RESEARCH ACHIEVEMENTS AND DIRECTIONS

Now the US Army Natick Research and Development Command (NARADCOM), the organization has four main laboratories: (1) The Food Sciences Laboratory headed by Dr. S. David Bailey; (2) The Food Engineering Laboratory headed by Dr. Abner J. Salant; (3) The Clothing, Equipment, and Materials Engineering Laboratory, headed by Dr. John Hansen; and (4) the Aero-mechanical Engineering Laboratory, headed by Dr. Irving M. Weitzler.

The US Army Research Institute of Environmental Medicine conducts basic and applied research to determine the effects of heat, cold, high terrestrial altitude, and work on the soldier's life processes, performance, and health. The goal is to understand the complex interaction of environmental stresses, the body's defense mechanisms, and the techniques, equipment, and procedures best calculated to make the soldier operationally effective and provide environmental protection. Research is also conducted on the physiological aspects and health effects of Army physical fitness training. Technical advisory and consultant services are provided to Army Commanders, installations, and activities in support of the Army Preventive Medicine Program.

The Laboratory conducts basic and applied research in human factors engineering and provides direct design support to all materiel development programs sponsored by DARCOM. Maintaining close ties with DARCOM and users, the organization seeks to determine major sources of error in weapon performance in artillery, armor, aviation, and infantry; to improve target detection and acquisition through better understanding of visual and auditory perceptual functions of the combat soldier; and to optimize design configurations of all materiel for soldier use. Among recent accomplishments are the development of an advanced-design state-of-the-art oculometer; experimentation of auditory/visual interaction (major finding: An organism can, at least momentarily, give maximum attention to only one sensory input at a time); and the development of a number of major man/machine materiel concepts. Programs now being conducted include: development and coordination of DARCOM/TRADOC-wide research on military operations in built-up (urban) areas; development of a simplified fire control system for US Army tanks; research in "interactive graphics" technology in support of development of future missile systems, tanks, and fixed-wing aircraft; materiel development in support of women soldiers, and a field study analysis of ammunition resupply, packaging, handling system.

## EVENTS AND ORGANIZATIONAL CHANGE

*1 May 1977.* A contemporary issues program was established in the US Army Research Institute to deal with the portions of the social processes research program that remained following curtailment of the program in the FY 1976 Work Program.

*1 May 1977.* The Organizational Effectiveness Technical Area was established as a major area of research in the Army Research Institute.

*July 1977.* An Army Research Institute Field Unit was established at Fort Sill.

## RESEARCH ACHIEVEMENTS AND DIRECTIONS

The program seeks to enhance soldier productivity through development of human relations training and more effective utilization of the Army's human resources. Assessment of the Race Relations/Equal Opportunity programs in the Army is continued. Support of these programs emphasizes development of methods and materials for courses at various command levels for the prediction and control of racial and other ethnic problems. Survey-identified attitude patterns and their fluctuations during an Army career are related to administratively recorded measures of performance to provide a basis for monitoring problems of individual and unit morale and esprit.

Objectives are the expansion of human performance capabilities for effective operation in military units and the improvement of soldier and team performance, motivation, and job satisfaction through organizational effectiveness (OE) techniques. Diagnostic instruments are developed to identify problems, intervention measures are developed and applied to solve or reduce the problems, and results are evaluated in terms of productivity and job satisfaction.

At Fort Sill, focus of Field Unit research is on training concepts for Field Artillery performance. Research on training concepts and delivery system development at the Field Artillery School compares performance of forward observers trained by computer-assisted (CAI) materials, self-paced audio-visual materials, and a combination of the two.

## ARMY CONTRIBUTIONS TO MILITARY RESEARCH PSYCHOLOGY

Although this document is primarily concerned with activities of formally trained research behavioral scientists--primarily research psychologists who have been involved as such in the Army--the document would be incomplete without a brief mention of many uniformed leaders who played a vital role in enhancing, guiding, sustaining, and at times carefully nurturing the program.

A few of the World War I leaders were W. C. Gorgas, Surgeon General; H. G. Leonard, Adjutant General; John S. Johnston, Adjutant General; and H. P. Birmingham, Brigadier General of the National Army.

Of special note during and after World War II were Colonel George R. Evans; Colonel Fred C. Milner; Lt. General Arthur G. Trudeau, an early chief of R&D in the Army; General Robert W. Porter, Jr., particularly as Deputy Chief of Staff for Personnel; Colonel Robert Storey; General Theodore J. Conway; General James F. Collins, who as DCSPER encouraged development of the aptitude areas; Major General Chester W. Clark, particularly when he was Director of Army Research; Lt. General Austin W. Betts, Chief of R&D and both follower and supporter of behavioral science research. Lt. Colonel Carroll B. Hodges, Colonel Charles S. Gersoni, and Colonel Marshall O. Becker commanded what is now the Army Research Institute during that period. Preeminent in providing impetus to training development through HumRRO were Generals John E. Dahlquist, Bruce C. Clarke, Herbert B. Powell, and Hugh P. Harris.

Of more recent note are Lt. General William C. Gribble, Jr.; Major General Charles D. Daniel, Jr.; Lt. General Harold G. Mocre, Jr.; Major General Robert G. Gard, Jr., particularly in his support of social processes in DCSPER and as head of MILPERCEN; Brigadier General John H. Johns, the first officer knowledgeable in behavioral science to attain the rank of general, and leader in the Organizational Effectiveness program; General Bernard W. Rogers; and many others.

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