LEVEL II

Proceedings of

United States Army Military Educational Advisors' Conference

Sponsored By

Human Resources Research Office
The George Washington University

Washington, D.C.
28-30 January 1958

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) PROCEEDINGS OF UNITED STATES ARMY MILITARY EDUCATIONAL ADVISORS' CONFERENCE		5. TYPE OF REPORT & PERIOD COVERED Conference Proceedings 6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s)		8. CONTRACT OR GRANT NUMBER(s) DA 49-106-qm-1
9. PERFORMING ORGANIZATION NAME AND ADDRESS Human Resources Research Organization (HumRRO) 300 North Washington Street Alexandria, Virginia 22314		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS		12. REPORT DATE 28-30 January 1958 13. NUMBER OF PAGES 156
14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office)		15. SECURITY CLASS. (of this report) Unclassified 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release; distribution unlimited.

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

The First United States Army Military Educational Advisors' Conference held at The George Washington University and sponsored by HumRRO, 28 - 30 January 1958.

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The purpose of this conference was (1) to serve as a medium of exchange of information, ideas, and comment among the Educational Advisors and Directors of Instruction of the Army schools represented; (2) to acquaint representatives of the schools with the research facilities and objectives of HumRRO, Personnel Research Branch, AGO, and the Army Participation Group in the Naval Training Devices Center; and (3) to identify additional important areas of research in Army training, which are not currently covered in the work programs of these agencies.

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

(2)

Proceedings of
United States Army
Military Educational Advisors' Conference

Sponsored By

held at Human Resources Research Office
The George Washington University
Washington, D. C., on
28-30 January 1958.

(15) DA-49-106-gmc-1

(11) apr 58

(12) 164 p.

The George Washington University
Human Resources Research Office
operating under contract with
The Department Of The Army

405260

The contents of HumRRO publications, including the conclusions and recommendations, should not be considered as having official Department of the Army approval, either expressed or implied.

Published
April 1958
by
The George Washington University
HUMAN RESOURCES RESEARCH OFFICE
Post Office Box 3596
Washington 7, D.C.

Contents

Proceedings of

United States Army
Military Educational Advisors' Conference

United States Army
Military Educational Advisors' Conference

Sponsored By
The George Washington University
Human Resources Research Office
Washington, D.C.

Agenda

TUESDAY, 28 January 1958

First General Session: Opening Activities

Lisner Auditorium

0830-0930	**Completion of registration of conferees**	**Lobby**
0930	**Call to order by the General Chairman** *Dr. T.R. Vallance*, Deputy Director, Human Resources Research Office	**Lower Lounge**
0935	**Introduction of the Secretary of the Army** *Dr. Cloyd H. Marvin*, President, The George Washington University	
0945	**Welcoming remarks** *The Honorable Wilber M. Brucker*, Secretary of the Army	
1015	**Introduction of the Commanding General, U.S. Continental Army Command** *Dr. Meredith P. Crawford*, Director, Human Resources Research Office	
1020	**Address** *General Willard G. Wyman*, Commanding General, U.S. Continental Army Command	
1050	**Coffee break**	
1110	**Orientation to the Conference** *Dr. Meredith P. Crawford*, Director, Human Resources Research Office	

Second General Session: Goals and Program of the Army School System

Lisner Auditorium

1130 **The Background and Present Pattern of the Army School System** — **Lower Lounge**

Dr. Rolfe L. Allen, Administrative Officer, Office of the Director of Organization and Training, Office of the Deputy Chief of Staff for Military Operations

1200 **Luncheon break**

Stockton Hall

1330 **The Soviet Army Educational System** — **Room 10**

Dr. Robert L. Plumb, Military Research Specialist on Soviet Training and Education, USSR Branch, Office of the Assistant Chief of Staff, Intelligence

1400 **Basic Principles in Establishing a School Program**

Dr. Ralph R. Fields, Professor of Education, Teachers College, Columbia University

1430 **Group discussions**

Group 1: Determining the essential elements of a course, with specific reference to courses for technical subject matters — **Room 30**

Discussion Leader: *Dr. J.C. Hammock*, Director of Research, U.S. Army Air Defense Human Research Unit, HumRRO

Group 2: The influence of the common subjects letter — **Room 31**

Discussion Leader: *Major Richard H. Groves*, Evaluation Branch, The Engineer School

Group 3: Developing a program of instruction with maximum integration and internal consistency — **Room 32**

Discussion Leader: *Dr. Ralph R. Fields*, Professor of Education, Teachers College, Columbia University

Group 4: The design and management of extension courses — **Room B-5**

Discussion Leader: *Mr. Robert B. George*, Educational Advisor to the Commandant for Non-Resident Instruction, The Engineer School

1600 **Reports from discussion groups, summary, and recommendations** — **Room 10**

Reception by The President, The George Washington University

1700 *Lisner Auditorium* — **Lower Lounge**

(A coffee break will be held each morning at 1000 and each afternoon at 1500.)

WEDNESDAY, 29 January 1958

Third General Session: Assessing the Outcomes of Military Education

Stockton Hall

0830 **Philosophy and Methodology of Educational Program Evaluation** — **Room 10**
Dr. Robert L. Thorndike, Professor of Education, Teachers College, Columbia University

0900 **Group discussions**

Group 1: Performance tests: individual skills — **Room 30**
Discussion Leader: *Dr. Melvin R. Marks*, Group Chief, Personnel Research Branch, The Adjutant General's Office

Group 2: Performance tests: unit proficiency — **Room 31**
Discussion Leaders: *Dr. Robert Baker*, Group Leader, U.S. Army Armor Human Research Unit, HumRRO; *Dr. Harry Bornstein*, Task Leader, Personnel Research Branch, The Adjutant General's Office

Group 3: Construction and analysis of objective and essay tests — **Room 32**
Discussion Leader: *Dr. Robert L. Thorndike*, Professor of Education, Teachers College, Columbia University

Group 4: Systems of assigning course and school grades — **Room B-5**
Discussion Leader: *Mr. Henry C. Porter*, Educational Advisor, The Armor School

1100 **Reports from discussion groups, summary, and recommendations** — **Room 10**

1200 **Luncheon break**

Fourth General Session: Instructor Training and Evaluation

Stockton Hall

1330 **The Rolo of the Instructor in the Military School System** — **Room 10**
Brig. General Henry C. Newton, USA (Retired)

1400 **Group discussions**

Group 1: What is a good instructor? — **Room 30**
Discussion Leader: *Brig. General Henry C. Newton*, USA (Retired)

Group 2: Problems of motivating the instructor — **Room 31**
Discussion Leader: *Dr. Edward P. Pickard*, Educational Advisor, The Engineer School

Group 3: Instructor training methods — **Room 32**
Discussion Leader: *Dr. Charles D. Smith*, Research Scientist, U.S. Army Air Defense Human Research Unit, HumRRO

Group 4: Whether and, if so, how to evaluate instructors — **Room B-5**
Discussion Leader: *Mr. Randall M. Nay*, Educational Advisor, Finance School, U.S. Army

1600 **Reports from discussion groups, summary, and recommendations** — **Room 10**

1700 **Recess**

Banquet

Roger Smith Hotel, Main Dining Room

1930 **Address**
Lt. General James M. Gavin, Chief of Research and Development, Department of the Army

Music furnished by the *Traveling Troubadours* of The George Washington University Glee Club; Dr. Robert Howe Harman, Director.

THURSDAY, 30 January 1958

Fifth General Session: Improving Instruction Through Better Methods and Training Devices

Stockton Hall

0830 **Teamwork of Instructor and Training Device — When and When Not to Use Either or Both** — **Room 10**

Dr. Clifford P. Seitz, Chief Psychologist, Army Participation Group, Naval Training Devices Center

0900 **Group discussions.**

Group 1: **TV as an instructional medium** — **Room B-4**

Discussion Leader: *Dr. Joseph Kanner*, Chief, Audio-Visual Applications Office, APS Division, OCSigO

Group 2: **How to make the most of student critique** — **Room 31**

Discussion Leader: *Dr. Norman C. Webster*, Educational Advisor, The Adjutant General School, U.S. Army

Group 3: **Making the best use of classroom and conference times** — **Room 32**

Discussion Leader: *Dr. Neal Andregg*, Educational Consultant, U.S. Army Provost Marshal General School

Group 4: **Review of training devices available for technical subject matter** — **Room B-5**

Discussion Leader: *Dr. Clifford P. Seitz*, Chief Psychologist, Army Participation Group, Naval Training Devices Center

1045 **Reports from discussion groups, summary, and recommendations** — **Room 10**

1145 **Luncheon break**

Sixth General Session: Improving Instruction Through Effective Administration

Stockton Hall

1300 **Opportunities for the Administrator to Maximize Training Effectiveness** — **Room 10**
Mr. Henry C. Porter, Educational Advisor, The Armor School

1330 **Group discussions**

Group 1: Planning administrative records for maximum usefulness in analysis and quality control — **Room B-4**
Discussion Leader: *Mr. Richard S. Kneisel*, Educational Advisor, U.S. Army Chemical Corps School

Group 2: Making the best use of aptitude test information — **Room 31**
Discussion Leader: *Dr. E.K. Karcher*, Group Chief, Personnel Research Branch, The Adjutant General's Office

Group 3: Improving communication between schools and departments — **Room 32**
Discussion Leader: *Mr. Norman B. Carr*, Educational Consultant, U.S. Army Southeastern Signal School

Group 4: Relating grades and elimination in different schools to quality of input — **Room B-5**
Discussion Leader: *Mr. William H. Helme*, Task Leader, Personnel Research Branch, The Adjutant General's Office

1500 **Reports from discussion groups, summary, and recommendations** — **Room 10**

Seventh General Session: Panel discussion — The Function of the Educational Advisor

Stockton Hall

1600 **The educational advisor as a consultant on tests, measurements, and grading** — **Room 10**
Dr. Harold S. Tate, Educational Advisor, U.S. Army Infantry School

The educational advisor in the review of instructional methods and instructor evaluation
Dr. Robert Allen, Educational Advisor to the Quartermaster Training Command

The educational advisor as an administrative consultant on procedures in educational administration
Dr. A.C. Poe, Educational Advisor, U.S. Army Aviation School

1700 **Closing activities**

FIRST GENERAL SESSION

Tuesday, 28 January 1958

Opening Activities

CHAIRMAN VALLANCE: The first United States Army Military Educational Advisors' Conference is now in session.

It is HumRRO's pleasure to serve as sponsor and catalyst—and I hope I'm not using that term improperly—for this meeting, which has been of considerable interest as it has developed. As General Chairman, it is my personal pleasure to extend to you HumRRO's welcome and best wishes for a pleasant and profitable conference. I should also like to express my gratitude to our mutual host, The George Washington University, for making its facilities available and for cooperating with us in many ways in setting up and managing this conference.

With that, I should like to introduce Dr. Cloyd H. Marvin, President of The George Washington University, Dr. Marvin.

DR. MARVIN: Mr. Chairman, Mr. Secretary, Director Crawford, General Wyman, members of the conference:

It is good to have you here.

We at the University are especially interested in this particular program because of its special significance to the Defense operations. This program was called at your instigation. It is a grass-roots program and one that has a peculiar significance to me and to those who represent the University.

We welcome you, as I say, because this is your idea. It represents a great change in the Army as some of us knew it in earlier years. Such a conference as you are holding today would have been almost an impossibility, had it even been thought of a decade ago. But the new idea in the Army of the value of the type of instruction you represent, in these days has taken root, and today you are coming together to exchange ideas that you might see what each thinks about in order to advance the Army program.

The response to this meeting has been magnificent, and I am sure that Secretary Brucker's representative here today pinch-hitting for him, Secretary Milton, must be most gratified that instead of having the 65 that we originally thought we would have when Director Crawford suggested that

we might call a group together, there has come together about twice that number. We really had to shut the doors, because there was so much demand to have an opportunity to get an understanding of the program.

So I congratulate you. I am happy over the recognition of the significance of this coming together on the part of HumRRO and its officials. I take this opportunity of thanking them for what they have done to make possible this meeting.

May I say just a word, because I shall not have the opportunity of doing so again, about our Director Crawford. He is upholding the best tradition in University service and of the Army, through his knowledge of what it is that the Army wants to do. I have had the pleasure of working with him now a number of years, and he has always been alert to magnify the small inventions that are of worth on the part of any of us and coordinate them so that two plus two is more than four. Let's say four-plus. This is his splendid contribution. He has gotten together an able group of men in HumRRO that have caught his spirit, and we all are indebted to him and to them for what they do for us.

Now I say a word about the Secretary of the Army, Secretary Brucker. I am sorry he could not be here. He had fully expected to be with us until yesterday morning.

He has been called to services that he just could not miss. In these rather hectic days I am sure that each one of us, regardless of how disappointed we are in not greeting him here this morning and having words from him, will be generous enough to know that there are times when men who are in the type of a position which he holds must listen to others' commands.

I do not know how many of you know him, but Secretary Brucker is a dedicated man if there ever was one. He is a man who has given up much in the civil life to hold the task that he holds. He comes to us from Michigan. I have come to have not only a great affection for him, which is a personal matter, but to have a great admiration for him, which I know that you would have if you had the opportunity, as I have had it, of being with him. He is alert. He is an honest thinker, a person that does not make judgments unless he has appropriate background upon which to make them. He is trained in that school of thought that holds that to lead is to serve those for whom he is responsible, and this idea is what dominates his thinking today as he has had to absent himself from us.

We are appreciative of the interest of the Secretary of the Army, and I can assure you that he is thinking of us as this conference is convened.

He has sent an extremely able person to represent him. We are fortunate that our Pentagon setup is not limited to one fine leader but several. Sometimes I wonder as I watch the integration of the thinking of those who are interested in the development of the Army and give themselves to that end, how it comes about that the gods bring together men whose services supplement each other in such a magnificent way.

We all are fortunate in these hectic days to have that integrative thinking as a base of our operations and of our direction from the administrative point of view.

To take Secretary Brucker's place this morning, we have with us Secretary Hugh Milton, the Assistant Secretary, whom I have known over a

period of years. I could go into his military service with you here this morning, but maybe he wants to tell you about that himself. I know not. It is a good one, and one that honors us all. I could talk with you about his university service, a distinguished one, because he has worked over the years for education until he was demoted to become a university president.

He has received many honors, both civil and military. I am not going to enumerate them. If you want them, you can find them in "Who's Who," but this I want to say about him, regardless of all else, the thing that marks him is that he is a gentleman whose origin is in the Blue Grass State of Kentucky, who matured in the great Southwest—need I say any more, Secretary Milton.

Mr. Secretary, I am sorry that I was not able to get you an invitation, because you unexpectedly take the place of the Secretary here today. If you permit me, I want to extend to you at this time an invitation for the reception this afternoon and for dinner—on Wednesday afternoon—as well as for all of the meetings of this conference.

SECRETARY MILTON: Thank you very much, sir.

DR. MARVIN: With these remarks, it is my pleasure to introduce the Assistant Secretary of the Army, Hugh Milton.

SECRETARY MILTON: Thank you very much Dr. Marvin, General Wyman and all of my friends.

At the opening session of the U.S. Army Educational Advisors' Conference, from left to right: Dr. T.R. Vallance, Deputy Director of HumRRO and Conference Chairman; Dr. Meredith P. Crawford, Director of HumRRO; the Honorable Hugh M. Milton, II, Assistant Secretary of the Army for Manpower, Personnel and Reserve Forces; General Willard G. Wyman, Commanding General, U.S. Continental Army Command; and University President Cloyd H. Marvin. Secretary Milton represented Secretary of the Army Wilber M. Brucker at the opening session. General Wyman gave the principal address.

The Secretary of the Army regrets that he could not be here today, but I think each and every one of you, whether you be in a mufti or in a uniform, realizes that these are very tense days, and none of us knows when he might be called upon to go up on the Hill maybe in support of more pay for the people in uniform or for an explanation of the defense posture of the United States or the reserve program, or a thousand and one other issues that develop with each morning's sun.

Dr. Marvin, I want to say that I appreciate, as an associate of Secretary Brucker, the very fine things which you said about him, every one of which is unquestionably true. I think we are very fortunate in having a man of Mr. Brucker's stature as Secretary of the Army, and he is an inveterate worker. I think I have put in long hours. I usually get to the office about eight o'clock in the morning, sometimes a few minutes before, but in the two and a half years that Mr. Brucker has been in office, I have never driven up that he was not there ahead of me, and it is always just a little embarrassing when your boss beats you to work. I would say that I usually go until seven-thirty in the evening, and I have never left that building that he was not still there; and on Saturday and Sunday, it is still the same. Sometimes when he is not in the building on Sunday, he is at his apartment.

So, we have, and we are very fortunate in having, a very dynamic, dedicated and highly motivated Secretary of the Army, and he regrets exceedingly that he could not be here this morning. Until late yesterday he was called over to the Hill, and last night I was told that I would be expected to be here, and his remark was that I ought to be here anyway.

It reminds me of a story. I was born and raised in Kentucky. I didn't put on shoes until after I was twenty-one. Then I migrated to New Mexico, which is the state of my residence right now, a state which has been defined as having more land and less people, more rivers and less water, and more cows and less milk than any other state in the Union. And that is where I was privileged to be a college president in the little town of Las Cruces where the A & M College is located.

One Saturday night, one of the local inhabitants was out on the town all night. There is no need for me to describe him further. And on Sunday morning he happened to pass by the Episcopal Church at early services, and the door was open. He paused and he heard the chant which goes like this: "Oh, Lord, I have done those things which I ought not to have done, and I have failed to do those things which I should have done." And this inebriated fellow perked up his ears and said: "This is exactly where I belong."

So, when the Secretary said to me that this is the place where I ought to be, I know that he did not have in mind any comparison with that inebriate, at least, I hope he did not. But he did feel that probably I would be very much at home with educators and dedicated men like yourselves, who realize the challenge of the day.

Mr. Brucker regrets that he could not be here. I am happy that I can substitute for him. I guess in all fairness I ought to read to you what he wanted to say, but years ago as a young Army officer, I was told this: that if a staff officer cannot bring himself into tune with the thinking of his commander, then he had better get out. So, in the light of the fact that I hope that I am a good staff officer to the Secretary of the Army, and knowing something of his thinking and his mental workings, I would just like to say that

HumRRO plays a very important part in the new day which is ahead for the United States Army.

As you so well know, we have adopted the pentomic concept, and there are many complex and very challenging ideas which must be experimented with and tried before they can be put into directives, yes, even new policies. This is where HumRRO has played such an important part, and it is in the light of what you are going to do in the tomorrow that you have gathered together here to talk about some of the new and challenging ideas, and to get them into some order or form that we of lesser mentality might digest them and write them out, so that people can implement them in the field.

It is highly appropriate that we should be here at this particular moment. Never before, to the best of my knowledge, has history ever faced the day when basic training and basic education were so important in their translation into the security of the nation. You hear this on every hand. Just last week I was up before one of the committees of Congress on just this same issue. You read about it in the papers. You know that in the states and nation our politicians are trying to find ways and means to bolster our basic education to the end that we will have greater national security.

Now, why should this day have descended on us somewhat "cataclysmically"—if I may use that expression—because certainly two years ago I do not think anyone would have prognosticated the problems of this particular moment. We have been basically in an atmosphere somewhat of the laissez faire and the status quo. We have been happy that the American people enjoyed eminence among the nations of the world in its technology and its productive capacity. We have always flaunted our way of life, and our comforts and our ease of existence, and I think that we felt that we had such a position among other peoples of the world that no one could possibly catch up with us. Within the last few months, maybe a little longer, we have been shocked into a sense of realization that we are not alone in the development of a technology; we are not alone in high productive capacity.

The Soviet, who a few years ago we said could not produce even tractors, we now realize are producing long range bombers and submarines and missiles, and weapons capable of carrying atomic and thermonuclear warheads great distances, and then not only that, but we realize that more important still the basic sciences and the basic knowledge, which are so essential as the foundation for any technology and any manufacturing process have been pushed by them to a point where it challenges our position among the nations of the world.

Now, this realization has caused, if I can read the pulse of America properly, an awakening on the part of our vast population of 160 million people, who are saying today, "What are we going to do about it?"

Hence this great stimulus that we find in the press and expressed by word of mouth and actions by state legislatures and the Congress of the United States.

What are we going to do about it? The first thing that we have got to do about it, my good friends, is to realize that we can no longer bask in the luxury of apathy and the status quo and the laissez faire, and that we have a way of life that cannot be challenged. It has even been that way in the past. Read Toynbee and all the rest of them. Peoples of the past, when they got to

that position, started on the decline of their social order. Jefferson once said that you have to be eternally vigilant, and maybe we have not been quite as vigilant as we should have been in the past.

What have we done in our educational processes? We have gotten away from the hard disciplines of education and training that come with your mathematics and languages and your sciences, and we have engaged in those easier courses which were designed to prepare us to make a better living—maybe more money:

So I say, there is an area that the educator today has to give a lot of thought to.

If you study the Soviet system of education over the last ten years, you will find—yes, it was during the last ten years, there is no question about that—but they got right down to those basic disciplines which I am afraid maybe in the immediate past we have somewhat forgotten.

Now, someone might think that I am somewhat of a pessimist in pointing up the fact that while we are basking in the luxury of time and position that the tortoise has overtaken the hare and can win the race. I say: not so at all—not so at all.

There has been a little saying that is always present in my mind. I think it is good advice: that there are three things you never can recall, one of which is the arrow in flight; the other is the lost moment; and the third is the spoken word. Now, that is pretty good advice for all of us who walk along the pathway of life. But, I do not think of these as lost moments. Connected with that I think of a story I know by Jules Verne written many years ago.

Dr. Marvin, you remember, he took a trip to the moon?

DR. MARVIN: You are getting back too far.

MR. MILTON: I did not ask you if you remembered the actual event. He took a trip to the moon. Now everyone said that that was so fantastic. I am sure that many a man has pushed aside a very delightful book because he thought that it might be the figment of a mind that was not too sound, and yet today we are talking of just that thing. But, if you remember in the story, "A Trip to the Moon," the individual threw out his dog who died on the trip, and three days later he looked around and there was the dog exactly where he had thrown him, and yet he was moving at a terrific speed. Now, it does not take a scientist to figure out that he was traveling at the speed of light. What I am saying is that while it might be true that there may be certain problems and I think there are certain problems, I think that education has got to be drawn together and the disciplines—the basic sciences—have got to be stressed, and while we have not done that in the past, I do not think of those moments as being lost. I think we can overtake them, and I think we have the means whereby we can do it, and I think that the implementation of those means is up to people just like you.

We have a vast educational system in this country. We have a vast military educational program. You are representing the service schools. You, therefore, already have in being the instrumentality by which, if there is any lag, we can catch up in a short period of time. The challenge which I throw to you this morning is not to waste too much time in catching up on those moments which may be lost.

Now, I realize that in this problem there has to be integrated political action. By that I mean legislation. There has to be the cooperation of the

educator, and then you people—you people must translate this education and training into a military establishment which is so essential to the security of this nation.

Now, this is a tremendous challenge that I am throwing out to you, but that is the challenge of this day.

You know, many, many times, as I walk down the pathway of the years, I catch myself wishing that I could have lived in days long gone by. I guess each and every one of you had this same experience. I was born and raised in the Southland, and many times I caught myself, as a youth, wishing that I could have been with Lee at Appomattox even. Or sometimes when my rambling, juvenile mind got over into the field of science, I wished I could have been Newton, so that I could have seen the apple fall and given to the world the law of gravitation. Sometimes I wished I could have been Kepler and given the great laws of motion which he gave to the field of science. But, do you know, as I weigh each of those days, it does not make any difference what it is, medicine, abstract sciences, social sciences, or what not, I inevitably come to the conclusion that today is the greatest day that history has ever recorded.

If you are thinking in terms of personal emoluments, there are greater chances to go down in history today than were ever afforded to a Lincoln or a Lee or anybody else, or an Einstein or a Newton, and all the rest of them. The problems are bigger. It takes bigger men and men with a broader perspective. What a day this is, because you are not just thinking in terms of just one nation or just one continent, you are not even thinking of just one world anymore, you are thinking of interplanetary space—so what a day we live in!

Gentlemen, that is what the Secretary would like for me to say to you, and let me add just this one thought if I may. In this challenge today no individual can foresee everything that might have some application. Emerson—and you should read it again for your own education and I should too—wrote an essay on education, and in that he advises: Don't let any thoughts get away from you, even though they might appear to be totally irrational. And any of us who are in our older years, when we think back to our childhood, remember the rigidity of thinking which past generations had. I am certain that many times today there are thoughts expressed by the man-on-the-street which a generation ago would have been so irrational that people would have thought that you were a little wrong in the head. And Emerson said do not let these thoughts, regardless of how irrational they might be, get away from you. Pursue them until you have satisfied yourself that they have no longer any validity.

Now I throw this in just as a little aside, but I want to couple it with this thought. So often in the past I, as well as you, have felt that the responsibility for the security of this nation rested somewhere else than upon the shoulders of Hugh Milton. How wrong I was, and how wrong you are if you ever for one moment entertain that thought. You are a sovereign king in your own right by the Constitution of the United States, and with the privileges that come to you there are responsibilities which rest upon you. If every individual can be made to realize it, there may rest the solution for some of these problems which in the composite may allow this nation to go on down through the corridors of time, giving to man the light, and the

sovereignty and the dignity to which he is entitled. If you get that thought firmly implanted in your mind and yourself, then, in the composite we will have a national security which no enemy could possibly assail.

Let me just end with this thought. Now, I cannot do everything. Neither can you. But I can do some one thing, and the one thing which I can do I ought to do, and what I ought to do, by the grace of God, I am going to do.

And then I would just like to conclude with this little oriental triad of wisdom, because I think it points up the urgency of the day: "When, if not now? Where, if not here? Who, if not I?"

DR. CRAWFORD: Thank you very much, Secretary Milton. And now it is my honor this morning to introduce a most distinguished officer. I can present him both as a soldier and as an educator, since under his command is almost the entire school system of the Army.

In exercising this command of the Army's educational and training facilities, General Wyman has shown keen awareness of the importance of efficient and combat-oriented training. I understand that the General spends at least half of his time away from his headquarters at Fort Monroe, and that he gives a great portion of his travel time to inspecting the several training facilities, and in conferring with those in charge of schools and training installations. Therefore, it is most appropriate that he be introduced as a military educator.

General Wyman's career in the Army attests his interest in scientific educational affairs. For example, between 1928 and 1932 he was a language student at Peking, China and served as a topographer for the Central Asiatic Expedition in Mongolia sponsored by the American Museum of Natural History, under the leadership of Dr. Roy Chapman Andrews. Further service in China came under General Stillwell, in 1942 when he became Assistant Chief of Staff, G-3, in the China-Burma theatre of operations. General Wyman served during the rest of World War II in Africa and Europe as Assistant Division Commander of the 1st Division and Commanding General of the 71st Infantry Division.

Following the war, General Wyman served as a Staff Officer in what was to be his present command which was at that time the Army Ground Force, both in Washington and Fort Monroe. During the Korean conflict, he was Commanding General of the 9th Corps in Korea, and then he moved to the other side of the world to become Commander of the Allied Land Forces, Eastern Europe, with headquarters in Turkey. Returning to the continental United States, he commanded the 6th Army from the Presidio in San Francisco from March, 1954 until August, 1955 when he moved to Fort Monroe as Deputy Commanding General, CONARC. In March, 1956, General Wyman succeeded General Dahlquist as Commanding General.

With this wide background of combat command, scientific endeavor and experience in a great variety of Army training, General Wyman has brought to his present command an incisive leadership in the primary mission of CONARC, that of Army training. General Wyman's scientific approach to the development of Army doctrine and thus the foundation for Army training is no better exemplified than in his establishment of the Combat Development Experimentation Center at Fort Ord. This foresighted enterprise represents, in my opinion, a most significant contribution to the Army of the future.

It has been my pleasure, from time to time, to discuss aspects of Army training with General Wyman. I have watched him in a detailed inspection of basic training for reservists, and I have heard him speak on the philosophy of education for the nation. I therefore salute him not only in his official capacity as Commanding General of the Continental Army Command, but also as a thoughtful and forthright president of a major educational institution.

I am happy to present General Willard G. Wyman, Commanding General, United States Continental Army Command.

GENERAL WYMAN: Thank you Dr. Crawford, Dr. Marvin, Mr. Secretary, Gentlemen.

It is with admiration that I watched Hugh Milton walk up to this podium and throw away his notes, and with such poise and assurance on 15 minutes' notice, go ahead with a very beautifully arranged talk. I haven't that temerity. Friday and Saturday, I engaged in several presentations in St. Paul and Minneapolis. Yesterday I was required to give a presentation at the War College, and in order that I do not get these various subjects of endeavor which I have been engaged in during the past few days crossed, I am going to pay a little more attention to my notes, if you will forgive me.

It is a real privilege to be here with you at the opening meeting of this week's conferences. It is an indication of the recognition by all of us of the requirement for the continual growth of our educational effort.

Growth is a mark by which we must live. Without growth, we will die. Our educational system in the Army has grown tremendously in the last years, both in the civilian and in the military area, and this conference must assist it and guide it in the continuation of that growth.

We in the Army are very proud of our school system. We know that the victories of World War II and World War I were attributable to our training base and our school system. It is a most amazing and proud organization that we have developed over the years. There is no substitute for experience, as we can all attest, but experience in the Armed Services is bitter, and can be acquired only in combat. There must be found some means by which we can substitute for that experience—a method to develop ourselves in the problems that confront soldiers in battle.

The best substitute found has been the school system. We can attest to its value when we think back and realize that in early 1940, an Army of some 300,000—and I think that is exaggerating—grew in three short years to the most efficient and magnificent army in the world, comprising some eight million people.

Now, it may be a repetition to you for me to say that, but I do it for the purpose of emphasis.

You really represent the largest school system in the world. This great army university has 36 schools and colleges within its structure, and it is my honor and responsibility to be engaged in the close supervision of the curriculum of 30 of them. This year we have as resident students some 148,000 people. In addition to that, we have almost an equal number of officers, enlisted men and civilians engaged in correspondence courses, with which so many of you are familiar.

We, at Fort Monroe, are particularly appreciative of the task that you have undertaken and have performed in the last few years. You have set

and maintained a terrific pace, particularly in the last 12 to 18 months. This increased tempo has been necessary because of the many changes in concepts of operation in the organization of our Infantry, Airborne, and Armored Divisions and our service support elements. With equipment related to new missile systems and new effects of special weapons, your effort is being directed toward meeting the need for new MOS training requirements, new MOS proficiency tests, revision of training manuals, revision of unit instruction (both resident and non-resident), and preparation of troop tests for new organizations and equipment. Though you have set this terrific pace, you have barely started. We are not going rapidly enough.

Have you ever thought that our grandfathers traveled at the same rate of speed going about the face of the earth that Alexander the Great traveled two thousand years ago? Now, in three generations, we are traveling several times the speed of sound. We find much imbalance in our technical development so outdistancing our progress in the many other areas of requirements which we have. Those of you who come from the 5th Army and the Command and General Staff School are particularly aware of what I am talking about.

This last year has seen us engaged in a tremendous struggle to catch up with the velocity of concepts of warfare and concepts of battle, as related to our new weapons and our new organizations. We still do not have a proper reflection of the most wonderful work you have done in the complete reconstruction of your curriculum. In this one year our schools do not yet reflect the thinking and the long view you are taking of the requirements that are still ahead of us. The Command and General Staff School will have to continue to find new ways and means of making prodigious strides of endeavor which are required of us to assure a proper solution of this problem facing us.

I discussed this comparison of Alexander the Great and our grandfathers the other day with Colonel Patterson, the Chief of Staff of General Medaris down at Huntsville, Alabama. He is my own representative on General Medaris' staff. I compared Alexander's rate of speed and that of our grandfathers to our own. He laughed a little and said: "I have a better one. When I was moving from Washington to Huntsville the other day by air, as I went over the little town of Pulaski, Virginia, I noticed a bright light over my shoulder and sure enough there was Sputnik going by. We had a little headwind, and it took us a little longer than usual to get to Huntsville, and then Sputnik went by again."

That is an important example of the speed now, and the endeavor that must be ours to stay abreast of the times.

We must be careful in the development of our training devices to be sure that we do not forget the element of the humanities that is so important in education. With the terrific development of technology and need for instrument-men, we can put too little stress on the requirement for leaders. We cannot put too great a stress on that requirement.

In 42 weeks, we can develop an individual of average mentality into a man who is technically proficient on the instrument necessary to control a guided missile—one technical instrument. But look at the young man who leads a 46-man platoon, a unit on whom the ultimate victory will always

depend. This young leader has under his control 46 of the most delicate instruments that nature can produce—each one different; each one subject to a variety of motivations, motivations that cannot be measured by exact science. All these instruments must be set in motion in complete coordination with each other under circumstances diverse and unpredictable.

I defy any training device to produce a technician to control these instruments to maximum effectiveness in 42 weeks.

This implies the breadth of interest which confronts our school system—areas of interest quite diverse from one another. We have the purely technical fields, the areas of research and development where basic research must receive particularly careful attention, and the combat area, the combination of the technical and the humanities in forms found in no other profession.

I would like particularly to compliment the HumRRO Research Organization, which Dr. Crawford heads up. They have made most significant studies in connection with our educational system. They have found ways and means to facilitate it in reaching some of our training requirements. Their studies are most startling and of particular application to some of our very difficult, technical MOS's. I am sure their guidance here will add much to the stimulation of this conference.

This last fall, I recommended to the Department of the Army that a board be established again to study our school system in order to confirm many of our present practices and to search for new devices by which we can develop ourselves. This board has been appointed, and my Deputy General Williams has been assigned as its Chairman, who initiated its work on the 7th of this month.

Here I will throw out a thought which I may work on upon my return to home station. There has always been a controversy as to the sequence of instruction and the sequence of assignment of young leaders when they first come into active service. I think we do have to draw a distinction between the civilian component elements and the young officer who is going to make the service his professional career. This is a definite distinction that has to be applied in instruction to these two categories of personnel. But basically the question comes down to this: should these young men, coming into the active phase, as distinguished military graduates from our colleges or United States military academies go to troops first or should they go to school first? Should the first instruction in our service schools be of such length as to fix them in complete professionalism, or should it be short, in the form of orientation, to prepare them for the gradual development of that professionalism? In other words, should we make them complete professionals to begin with, or should we let it be gradually assumed?

It seems to me that we can compare ourselves here to the civilian educational requirements available to the professional young man, and we find that professional areas require much postgraduate work. A doctor, a lawyer, or a scientist cannot compete with his contemporaries with just a four-year college education. Why should our young men graduating from our colleges and military schools, and coming straight into the Army, find postgraduate education less important in the military service than it would be in the sister civilian areas.

So, I leave this question with you, as I have with the Board at Fort Monroe. Would not our professionalism be improved by immediate post-graduate work of an intense sort at your service schools, with the first-lieutenant's commission being awarded in recognition of successful completion, as is a master's degree awarded in the civilian educational system?

I would like to quote here an example of the military mind on this subject, because I visited one of our very large installations the other day, over which a very senior and a very experienced officer was in command. I broached this question to him, and I knew he was of the mind of the fixed idea that a boy who comes out of college should go straight to troops and know what his work is like and what he has to do. I was not offering this thought to him as a directive. I wanted to have him develop his thoughts on the subject. I explained it to a very great degree, and I thought I had lost the battle.

About two weeks later, I received a letter from him. He said he was not able to sleep that night thinking about the question that I had raised, and for that reason, as so often very senior people do when they are in trouble, he called the board. The board was filled with officers of the same thought and the same experience as his, and they were very much in agreement, in general, as they started their proceedings, that the youngster needed troop duty first.

They worked for about two weeks on the question and had an opportunity to work with the young men who were concerned, and then I got the most eloquent letter from General Sink, in which he said: "I have to apologize. I reverse my opinion, and the people who are on my board reverse their opinion. We have talked with these young men and they know what they need. They are unable to compete with the young enlisted graduate as he gets his commission, because he comes with such terrific knowledge of the enlisted area of operation before he goes to his officer's training school."

So, it is important that our educated young men from colleges where they put the most emphasis on humanities, I feel, superimpose a professional postgraduate year on their development as officers. It is still a thought that is very controversial, and I will be interested in how the board working on it at Fort Monroe comes out on the thing.

Now, I would like to throw in a thought perhaps foreign to this discussion, but pertinent to educational problems of the country. Are we properly utilizing the fine mentalities of our American youth?

Recently, at a meeting of the Association of the U.S. Army, I left this thought, which I would like to leave here. I have been particularly impressed this last year with the application of the Reserve Forces Act, where young men between the ages of seventeen and eighteen and a half volunteer for a six months' program. These men represent a special class of our American youth. They are not letting any opportunity to serve slide by like so many of their contemporaries. They are seeking responsibility at an early age. They are practicing the adage that "Youth must serve to be served."

The very fact that they have taken such a decisive step of their own volition, selfish or not, to plan their education and careers, marks them as men right then, who are going places in life. One of the impressive things about these young men is their maturity and the speed with which they develop mentally, physically, and morally, under the stimulus of military training.

They are learning to perform a man's role in the defense of their country. They are growing in manhood. You, yourselves, know that these young men, trained in the service, return to their homes and schools ahead of their contemporaries who stayed behind.

Despite widely published forecasts of reduced induction quotas for the armed forces, the response to voluntary training soared far above the ceiling that our budget would permit. It restricted training capabilities. According to a recent survey, 87 per cent of the young men now in the training program are recommending the program to their friends. Thirty per cent say that their decision to enter the voluntary program was prompted by the recommendation of friends in the service. This is very significant, in view of the fact that the early trainees numbered only a tiny fraction of the group now training. This was done by word-of-mouth endorsement that advertising money could not buy, nor all the technique of Madison Avenue engender. Last spring we had a long waiting list of volunteers. In my opinion we would have had a longer waiting list for next year if the word had not gone out that we are cutting back.

Since it will not be long before I lay my uniform aside for mufti, I would like to lay any military considerations aside for a moment and raise a question simply as an American citizen. Here in America, where the soldier is a citizen first and last, this should not seem incongruous, especially not before an audience such as I have today. Speaking only for myself then, not for the Army nor for anyone else in uniform, this is my question:

Should the youth of America be denied an opportunity like this for self-development? Can we afford to deny it to them at a time when the future of America depends so critically upon accelerating the development and education of our youth? Instead of reducing the training program, should we not expand it in scope and purpose? This is not, I repeat, a question of Army, or even of military concern. It is a question of national concern. Hence I suggest a new name appropriate to it: "Voluntary National Service."

The present program is only a prototype of what I mean by Voluntary National Service. As now conducted, our own volunteers complete basic training during the first four months. Then they go to advanced training at their armor service training centers. On the basis of aptitude tests, some are given short courses in such specialties as electronics, radar, and even medicine. But our interest in their education should not end there, as it must now. Those who excel should go on, and we should help them to do so with scholarships to universities and technical institutions. Their development should be fostered to the uttermost limit of their capacity.

Unlike Universal Military Training, National Voluntary Service would be precisely what the name implies—voluntary. Unlike CCC, however worthy that youth program may have been in its day, National Voluntary Service would provide a basis for developing the highest mental resources of our youth. Completely in accordance with our American concept of democracy, it would offer opportunity to youth with ability and willingness to serve. It was precisely because this land offered such opportunity that young America grew into her present stature in the world.

True this program would cost money, but think of the dividends that would accrue to the nation. From these dedicated, highly trained volunteers we could recruit government scientists, foreign service and State Department specialists. Every branch of government and private industry would benefit—benefit by planned youth development.

Funds to support National Voluntary Service, obviously could not and should not come from the Army, but from all sources appropriate to the purpose of the program itself: citizenship development. As I see it, basic training, should be a joint Army, Navy, and Air Force responsibility; but advanced training must involve other departments, since every department of government would have an interest in the final result. While the Army, or the Department of Defense may exercise supervision over the very early phase of the program, supervision over later stages would be assigned to the Department of Health, Education and Welfare, or some such other agency as our government might deem proper.

If such a program seems futuristic or visionary, let me remind you that it is many years old in some parts of the world. In the Soviet Union, for instance, young men and women with high aptitudes have been induced, or rather, compelled to develop their talents under government educational grants. Should we do less than offer a voluntary opportunity to youth to develop in a democracy. If we can afford to subsidize anything grown in the country, certainly we can afford to subsidize the growth of talent.

The technological benefits that the Soviet Union affords have been represented by their investment in their youth. They are already beginning to appear and to "beep beep" on our horizon. If anyone sneers, "But this is not Russia," I say, "Let's keep it that way."

I have received many letters and inquiries concerning this thought and I would like to leave it with you as a personal thought rather than as a consideration approved through official channels. Actually it has never been presented for approval.

Though I was requested to talk to you this morning in the vein of a keynote address, I have preferred to approach my subject as something of a rumination on our over-all educational area.

I would like to leave with you the thought that we are happy with the progress we are making in the school system. We are very proud of the work that is being done. I wish I could be with you during the discussions this week. I know you will profit by the exchange of ideas and experiences, but as a keynote, I would like to reinforce the remarks of Hugh Milton, and say this: we must grow. If we do not grow, we die. And it is later than we think.

Thank you very much.

CHAIRMAN VALLANCE: Thank you very much for your remarks.

As you know we have come to that time that is inevitable in the middle of every morning, the coffee-break. We hope that General Wyman and Secretary Milton will be free to stay with us for the rest of the program.

We will reconvene in 20 minutes.

(A short recess was taken.)

CHAIRMAN VALLANCE: We have gained ten minutes on the calendar so I suggest we keep that comfortable lead and proceed.

The next item on the agenda calls for some additional orientation to the conference. It sounds quite familiar to those of us who have been working with the conference for quite a while, but I am sure there may still be questions in the minds of many, as to when and how and why the idea of such a conference arose, and to go into this matter, I would like again to introduce Dr. Crawford, the Director of HumRRO.

DR. CRAWFORD: It was a year ago last summer, in talking with Dr. Poe, the Educational Advisor at the Army Aviation School at Fort Rucker, Alabama, that the idea for this conference was conceived. He and I discussed the work of the Educational Advisors in an Army school and the relations between the Advisor's activities and research. We noted that the Educational Advisors, together with the Directors of Instruction, in the several Army schools, have many common problems, but that to date there has been no professional meeting ground in which matters of common technical interest could be discussed. Many of these questions of educational policy and practice are also matters of interest to HumRRO in its research on Army training. It therefore seemed to us that it would be worthwhile to suggest to CONARC that a conference be called of Educational Advisors, Directors of Instruction, and representatives of HumRRO to discuss questions of educational content and method in the educational and instructional work of the Army school system.

I therefore welcome you to what I hope may prove to be the first of a series of conferences among those persons with a technical interest in Army schooling. I also take great pleasure in noting the presence of observers from the Department of Defense and the Navy, Air Force, Marine Corps, and Coast Guard, and I believe I saw an officer from the Canadian Army here this morning. Our friends from the civilian educational world, who will speak to us at various times during the conference, are also most welcome.

A brief review of the composition of this conference is in order. There are 32 different Army schools represented, including all of the schools under CONARC supervision and the United States Military Academy. A total of 68 official representatives come from these schools, some 40 per cent of whom are civilians. In addition, there are representatives from several Army headquarters, including the General Staff of the Department of the Army, CONARC, and the Technical Services Headquarters. Research organizations represented include the Operations Research Office, the Personnel Research Branch of the Adjutant General's Office, and the Army Participation Group in the Naval Training Devices Center. Representatives of the Department of Defense and the other services total 16; some 35 HumRRO personnel will participate or observe.

In summary, we expect attendance at one or more of the sessions from about 170 people, 33 of whom have an official participation in the agenda.

The specific purposes of the conference are threefold:

First, to serve as a medium of exchange of information, ideas, and comment among the Educational Advisors and Directors of Instruction of the Army schools represented.

Second, to acquaint representatives of the schools with the research facilities and objectives of HumRRO, Personnel Research Branch, AGO, and the Army Participation Group in the Naval Training Devices Center.

Third, to identify additional important areas of research in Army training, which are not currently covered in the work programs of these agencies.

As you note from your program, the conference is organized in such a way that there is an opportunity for summaries and recommendations as they may be appropriate at the end of each of the technical sessions. During these summary sessions I trust that progress toward these three objectives will be recorded.

Planning for this conference began last September. My office directed a letter to CONARC proposing the conference, outlining the objectives listed above, and suggesting a variety of topics for discussion. The G3 section of CONARC then queried the several schools as to the desirability of the conference and invited suggestions for topics. The conference was then approved by the Office of the Chief of Research and Development and a tentative agenda was prepared around the topics suggested to CONARC by the schools. An effort was made to include as many areas as could be meaningfully organized into seven general sessions, the first of which will be completed as soon as I get through. The remaining six sessions scheduled for the rest of today, and for each morning and afternoon of Wednesday and Thursday, are organized around five major topics as follows: Goals and program of the Army school system; assessing the outcomes of military education; instructor training and evaluation; improving instruction through better methods of training and training devices; improving instruction through more effective administration.

For each session we have planned one or more major presentations to provide an overview of the topic as a whole. Speakers have been chosen for their special qualification in each area and have been drawn from the Army school system and from the civilian educational world. Following each presentation, four discussion groups are organized around specific topics within each area, and discussion leaders have been chosen from the group of invited speakers, representatives of the Army school system, and members of the research organizations represented. Following these discussions, we will reassemble to hear reports and recommendations from each group, and will have opportunity for discussion from the floor of the several points raised in the discussion groups. A panel discussion on the function of the Educational Advisor constitutes the last session.

In addition to these technical sessions, the President of the University, Dr. Marvin, is host to a reception this afternoon in this room at 5:00 o'clock p.m.

Tomorrow evening, at the banquet at the Roger Smith Hotel, General Gavin, the Chief of Research and Development, will be the speaker.

The final session will occur at 5:00 o'clock p.m. on Thursday evening, when we will consider the outcome of the conference and discuss the desirability of further conferences of this kind. You have observed the conference stenographer at work. We will make every effort to publish with dispatch a conference report to include the text of the major addresses, the reports of the discussion groups, the conclusions and recommendations of the general sessions, the list of participants and guests, and other pertinent information.

Now, in the time that remains to me, I would like to acquaint those of you who do not already know us with the organization responsible for planning and conducting this conference, the Human Resources Research Office.

The primary mission of HumRRO is to do research in Army training, including leadership training, together with studies of motivation and morale in the Army, particularly as they are related to training. HumRRO is a unique organization in that it is supported by contract between the Department of the Army and The George Washington University, but its activities and personnel extend far beyond this campus.

In your package of conference materials there is the most recent edition of our informal summary of research for the fiscal year 1957, entitled "What HumRRO Is Doing." It is a green book. In this bulletin you will find popularly written accounts of several current and completed studies, together with a bibliography of our major publications during that period, and, in the back, an organization chart. From this chart you will observe that the research itself is done in the Training Methods Division, which has its headquarters on the campus here, in the four U.S. Army Human Research Units located at major military installations, and in a Detachment of the Training Methods Division at the Army Aviation Center at Fort Rucker.

The major areas of research of each of these groups are indicated on the chart.

The Training Methods Division is undertaking a variety of tasks, some of which are of primary interest to CONARC, some to the Technical Services, and others to the Army at large. Research on training the maintenance and operator personnel for electronic equipment represents a major block of this Division's work, as do studies of methods of instruction for Army schooling.

At the Aviation School Detachment the development of proficiency measures for helicopter pilots has been the major activity and work is now underway on the aerial observers' course.

At the Armor Unit at Fort Knox, research is centered about armor training. This spring, the development of a new program for advanced individual training will culminate several studies. Research in night operations, in the training of a crew as a whole, and explorations of span of control, should yield results of interest not only to Armor but to other branches as well.

The Leadership Unit at Presidio of Monterey is concentrating on studies of the interpersonal aspects of military leadership and in the development of techniques to improve military performance under stress. These long-range studies should be of Army-wide significance.

At the Infantry Unit at Fort Benning, major effort will be devoted to research on that most important first eight weeks of every soldier's training in the Army, namely basic combat training. In addition, the Unit is developing programs of instruction for the combat rifleman.

At Fort Bliss, the Air Defense Human Research Unit has research underway on the training of maintenance, operator, and officer personnel for surface-to-air guided missiles.

HumRRO is currently engaged in 33 tasks this fiscal year, and is proposing some 45 for consideration by CONARC and the Department of the Army for FY 59.

During our six and one-half years of operation, I feel that our major contribution to the Army has been made in terms of recommendations for

improvements in specific individual Army training programs. However, significant results have been achieved in studies of general training techniques and psychological stress.

As indicated in many places in the green brochure to which I referred, we have gradually evolved what seems to be an efficient and profitable method for developing an improved school course or Army training program. I would like to outline the steps in this procedure because I believe they are vital to the kinds of technical discussions which we will have during the next few days on the improvement of Army training programs. The objective of research is one or both of the following: to increase the quality of training output with no additional cost, or to maintain the quality of output at less cost, or both. To meet these objectives, the following steps have proven useful:

First, an activity analysis: A detailed study of the military subsystem of which the job is a part, is followed by detailed analysis of the required job duties as prescribed in training directives. Observations are then made, in the field, of men on the job, to include detailed records of the way their activities are performed and the difficulties encountered. We thus obtain a precise picture of what the man is supposed to do and what he actually does in relation to the function of the total man-weapons system of which he is a part.

Second, proficiency measure construction: With this detailed picture of the job, we then proceed, with the help of military specialists, to the development of means of measuring the man's proficiency on the job using samples of the activities observed in the first step. This is a most important step in that a precise and quantitative definition of the job is provided, on which it is possible to reach agreement between military and research personnel that the specified degrees of proficiency on the defined knowledge and skills are indeed the objective of the training. This proficiency measure is designed primarily around field performance on the job rather than school course or ATP training content, and the measure is often standardized on experienced men in the field. It should represent, therefore, more than a final course examination and should indicate the expected initial performance of course graduates on the job.

The third step is the development of a new training program. Proceeding independently of the proficiency test development, using information obtained in the activity analysis, together with knowledge of successful techniques in military training and principles of learning, a new training program is developed. Techniques which include a clear statement to the soldier of training objectives, simplification of materials to be learned and frequent practice with knowledge of results, are combined in the development of new lesson plans. This instruction may be shorter than the current instruction or may be more comprehensive, as the research objectives require.

The fourth step is the experimental test. When the new training program has been developed, and parts pretested as may be necessary, an experiment is performed in which randomly selected samples of students are given the old and the new training program and are measured on the performance test developed in Step 2. The conditions of this experiment are controlled as carefully as possible. If graduates of the new training

program make scores on the performance test which are significantly higher, in both a statistical and practical sense, than those on the current standard course, we recommend consideration of this program for adoption. In most cases further testing by the Army is desirable before final adoption.

I will not illustrate these research procedures by specific examples, since some of you already are familiar with them and others may find examples in the brochure I referred to.

I have listed these steps, however, to make the point about the need for objective analysis of performance and quantitative measurement as essential in research and development toward improving Army training. Most of our discussion during this conference will center on these topics. I believe that this approach will yield important improvements in Army training whether used by members of a research organization or by technically qualified school personnel.

It is apparent to us here in HumRRO that the curriculum engineering—as we sometimes call the execution of these four steps—of each of the training programs in the Army, is neither a feasible nor a profitable task. Certain findings already obtained may be generalized to similar programs.

At present there is an analysis underway in my office of a large number of Army training programs to pinpoint those particular ones which may need specific R&D effort, and also to identify communalities of content and method in a variety of Army training programs.

On the basis of this analysis, we propose to continue research on more general principles of learning and training which will apply to many Army programs. Some of these studies are already proposed or underway on general methods of classroom instruction, on instructor training, and on special methods for teaching men of limited aptitude. These studies will be supplemented by research on learning and motivation which we believe to be basic to all Army instruction.

This brief review of the HumRRO programs brings me back to one of the purposes of this conference. In addition to the exchange of information between school personnel, I hope that we research personnel will learn much from you about particular problems of military instruction. We will be most attentive to the presentations and discussions of this conference; conversely, we hope that you, who are the primary users of our research findings, will increase your acquaintance with the results we have already obtained, with the studies that are currently underway, and will suggest topics of general significance in Army training so that we may perform research which will be maximally useful in a variety of training situations.

I feel that we now have an opportunity to join together toward the goal of rendering to our nation a superbly trained Army. We must make the most efficient application of all of the technical skills and know-how which we can bring to bear on this most vital function of the Army, the training of men for combat. As Secretary Brucker has stated, "The Army in peacetime is essentially a training organization." We have a challenging task in playing an effective technical role in this great national objective.

SECOND GENERAL SESSION

Tuesday, 28 January 1958

Goals and Program of the Army School System

CHAIRMAN VALLANCE: Dr. Crawford in his remarks of orientation to the conference noted that one of the purposes in getting this conference going was to exchange ideas with one another among the schools as to how various problems are dealt with, and to learn more about how other schools do their jobs, what their missions are, and to get acquainted with the people who do the kinds of work so essential to keeping the Army School System at its maximum level of performance.

Many of us—and I use the term "us" advisedly—have been closely associated with one school or another for a good many years, and (at the risk of a cliché), there is some possibility that the mistaking or not seeing the woods-for-the-trees type of activity might take place. That is, we might become too intimately associated with our own work and deprive ourselves thereby of an opportunity to find out how it is done down the street.

Our first two speakers then, in the opening of the second general session of the conference, have been particularly selected for their knowledge and capability of giving us some other information in the larger view of the Army school system, and to provide additional background in the form of a review of the school system run by our major competitor, the Soviet Union. Our first speaker before lunch is a man well known among Army educators, a man who has been in the Office of the Director of Organization and Training of the Deputy Chief of Staff for Military Operations of the U. S. Army. He will give us a review of the current pattern and background of the Army training school system.

I give you Dr. Rolfe L. Allen.

DR. ALLEN: Ladies and Gentlemen of the conference:

More years ago than I now like to admit, when I was a freshman in college, I had the privilege of attending a speech class conducted by a very wonderful old gentleman, Dean Spence, then in approximately his eightieth year. At the second meeting of that class, he cleared his throat, as was his practice at the beginning of his lecture, and said in a very serious voice: "Gentlemen, the trained speaker never opens his remarks with an apology."

And then he stopped. When the pause began to be a little noticeable, a rather unacademic smile lighted up his face, and he said: "However, it is just as well to explain a bit."

This then is my position. I have three apologies to offer—not too seriously, I hope. First, as the tail-end Charlie before lunch of such a distinguished series of speeches delivered by such a distinguished panel of speakers, I feel a little diffident in occupying your time. Second, we have had from Secretary Milton, the almost awesome and challenging peek at the future that lies before the Army if you gentlemen do your work as well as we know that you will, and from General Wyman, a splendid picture of the Army of today, confident and competent. I am called upon to bring up the dead shadow of the past over this forward-looking convention. Third, there stands before you an obsolete man in this day and age of physics, mathematics, the natural sciences. I am a product of the humanities and the social sciences, and so I apologize for my existence.

In reviewing the subject matter for a discussion of "the background and present pattern of the Army School System" one of the most evident facts, as one goes back in time to the earlier days of our national existence, and to the Army as it functioned in those eras, is that while Army training schools have a very considerable historic background, the establishment of anything that can reasonably be termed an "Army School System" is a relatively recent event, having its beginnings at the opening of the twentieth century.

This is not to say that Army schools did not exist prior to 1900. Actually, service schools of the Army were born with the nation, a School of Engineering having been established by the Continental Army in 1776. However, more than a century of peace and war was to pass before the concept of a system of schools, providing a coordinated pattern of training was evolved. It may seem strange to the American of today that such a simple idea as the necessity for an organized Army school system was so late in appearing, but, viewed in the perspective of our earlier national life, and, particularly, in terms of the defense missions and problems of the American armies of the past, the reasons for this situation become quite clear.

While the people of the United States created this nation by armed force, and have, again and again, found it necessary to wage war in its defense, peace has always been regarded as the natural and proper state, and the desire to develop the military art, except as an immediate answer to the threat of attack, has never had popular support. Further, the history and geographical location of the United States combined, during much of our national life, to limit the need for an Army of significant size or strength. Protected by the Atlantic Ocean, the vast wilderness of the West, the military weakness of our neighboring states, and, perhaps most of all, by the mutual jealousies and animosities of the great military powers of Europe, the American people turned their energies to fighting the wilderness, rather than other nations, and to the creation of a great economic machine, rather than a great military machine, for nearly 150 years.

True, during this period, wars were fought with Great Britain and with Mexico. However, these interludes were of relatively short duration, and the fact that repeated military defeats in our second war with our English cousins failed to bring any disaster in their wake may have added

to the popular belief that Americans were natural soldiers, who needed no preparation to overcome any opponent. As a matter of fact, this viewpoint was by no means as absurd during the first decades of the nineteenth century as it was when propounded immediately prior to our entrance into World War I. In our first wars, we faced either lightly armed British expeditionary forces, hampered by the fantastic logistical problems imposed by combat 3,000 miles from their major bases, or a Mexican army, even less well trained and equipped than our own.

On the other hand, the American volunteers who filled the ranks, and accepted the commissions, in our first armies, were very well qualified for the primitive soldiering of the period. The great bulk of our forces were infantry, and the farm boy or frontiersman of America made a splendid foot soldier. The rifle was a basic tool, defender, and source of food on almost every farm, and it was the very symbol of the frontier. Ability to march tirelessly and swiftly, to forage, to live in the open, to endure hardship were the common skills of farmer and pioneer. Many of the western and southern recruits were skilled Indian fighters. With such raw material, the basic problems were creating discipline, cohesion, and teamwork, and, above all, of providing leadership.

To the limited extent that our early armies included the other combat arms and the technical services, the problem was a very different one. Cavalry could be recruited and trained in small numbers, but the artillery taxed the ingenuity of the commanders. Since the great majority of the volunteers of the day were completely, or virtually, illiterate, and ignorant of the simplest principles of arithmetic, let alone mathematics, training was necessary. Similarly, the engineering sciences were almost unknown in America, and the few men who possessed such skills seldom volunteered. There was an old joke in our post-Revolutionary army which went: "If a recruit can read and write put him in the Corps of Engineers; if he can read, but not write send him to the Artillery; if he can neither read nor write, but has a horse, he's a Cavalryman; if nothing good can be said of him, make him an Infantryman." And this joke came very close to summarizing the personnel assignment policy of our Army down to the War Between the States.

However, slowly and haltingly, school training came to the United States Army. I have already mentioned the School of Engineering, of 1776. As most of you will recall, this pioneer effort was converted after about six years, into the United States Military Academy, which, in the traditions of its predecessor, became the first collegiate-level school of engineering in the United States. In the meantime, a new "Engineer School" had been established in 1801. Twenty years later, our first infantry school, designated "The Infantry School of Practice" was activated. It was paralleled by the Artillery School of Practice created at about the same time. Almost 55 years later, cavalry training was started in a combined School of Application of Infantry and Cavalry. In this school, the mission of training applicants for commissions in the Infantry and Cavalry involved many subjects which might surprise some of you gentlemen. May I quote from its original curriculum?

"Everything which pertains to Army organization, tactics, discipline, equipment, drill, care of men, care of horses, public property, accountability, and generally of everything which is provided for in Army regulations, as

well as reading, writing, grammar, arithmetic, geography, history, algebra, geometry, trigonometry, sufficient for the measurement and delineation of the ground, and the science and practice of war, so far as they can be learned from books."

And you gentlemen think you have a problem today!

Under the circumstances, it appears that relatively few schools would have been needed. Fortunately, the harassed faculty members of the School of Application of Infantry and Cavalry were allowed two years to complete their course. Strangely enough, 42 lieutenants actually survived this formidable curriculum and received commissions. Emboldened by this success, the staff established, ten years later, the Army Medical Service school, which still continues its teaching activities.

The first, halting period of Army school activation, which had occupied nearly a century and a quarter in evolving the concept that at least some military skills were better learned in the classroom than in the field, ended abruptly in 1898. When the United States, proud of its size, wealth, and industrial strength, entered the stage of world power politics through its war with Spain, victory over a very weak and unready opponent came in just 100 days. However, after the period of self-congratulation which followed the end of hostilities, many thoughtful Americans, aware of the confusion, the bungled tactics, the lack of knowledge of amphibious warfare, and the disgracefully bad logistics—although the term was not then in use—recognized the complete unreadiness of the United States Army to meet any powerful opponent beyond our borders, and demanded measures of reform. While the brief conflict indicated that, in general, Army officers in the lower echelons were fairly competent, it was apparent that those in positions at the higher levels were almost completely unprepared to handle the problems of sudden mobilization, training, and the widespread deployment of military forces.

In response to the failures of the War with Spain, Secretary of War Root, in November 1901, formulated a progressive scheme of instruction for all Army officers, and directed the establishment of a War College Board. Simultaneously with the opening of the new Army War College, modeled upon the war colleges of the major European military powers, the formation of the War Department General Staff, in 1903, justified the emphasis placed by the new school on the academic consideration of large-scale tactics and national strategy. While the Army War College was not destined to produce a Clausewitz or a Mahan, it was able, during its first ten years of life, to create a solid core of American Army officers capable of understanding the problems and responsibilities of the new mass warfare which was forecast by the great armies of the European powers, and to establish doctrine which did much to prepare the Army for its role in World War I.

At the same time, the thoroughgoing Mr. Root reopened the former Infantry and Cavalry School at Fort Leavenworth as the General Service and Staff College. Instruction at this new school was concentrated on higher command and staff subjects, with basic officer training being delegated to post schools. Thus, for the first time, the postgraduate military college and an orderly system of command and staff training had appeared in the United States Army. The Root system also made provision for effective school training for the combat arms and technical services. The Engineer and

Infantry Schools were reorganized. A new School of Ordnance was activated in 1901, followed in 1910 by the Quartermaster School, and, in 1911, by the Artillery School of Fire. As a result of this period of expansion, a true Army school system had come into being. The great transition from the eighteenth century concepts, which had dominated American military training from the Revolutionary War to the War with Spain, was completed in time to at least partly prepare us for the war which was already casting its shadow over the country.

Although the Army command had some idea of the problems that would be posed by our entrance into the First World War, there was neither time nor public support, during the months between August 1914 and April 1917 to make large-scale preparations for the conflict into which the United States was inevitably drawn. When a major build-up of our Army was undertaken in 1917, the lack of adequate preparation by the Army, the nation's industry, and the public exacted a heavy price. Two particular areas of deficiency stood out. The Army's methods of training recruits were inadequate to meet either the quantitative or qualitative demands of the great struggle, and hasty improvisation, based largely upon the tested methods in use by the French and British armies, was necessary. Even more startling to the American people, who had been convinced that the industrial machine of the nation, then by far the greatest in the world, could easily meet any requirement for weapons and other material, was our logistical debacle. When, after the Armistice, the public slowly began to learn the extent of our astonishing industrial failure, a storm of criticism followed.

Mr. David Lloyd George said: "There were no braver or more fearless men in any Army, but the organization at home and behind the lines was not worthy of the reputation which American businessmen have deservedly won for smartness, promptitude, and efficiency."

That the Prime Minister's comment was a courteous understatement was made clear by such American military and industrial leaders as General Pershing, Bernard M. Baruch, and Daniel Willard, all of whom, in testimony before the Congress in connection with the revision of the National Defense Act of 1920, pointed out that our effort at industrial mobilization had, in all, been a colossal failure—badly conceived, badly administered, and badly executed—and that the greatest industrial power in the world had been heavily dependent upon its hard-pressed allies for such items as machine guns, field guns, heavy artillery, tanks, aircraft, and even hand grenades. This bitter lesson led to the requirement, in the National Defense Act, that the Secretary of War was responsible "to insure adequate provisions for the mobilization of material and industrial organization essential to wartime needs." In February 1924, in compliance with this duty, the Secretary of War established the Army Industrial College, an institution at the graduate level, dedicated to organized study of industrial mobilization and procurement planning. This action was particularly noteworthy in two respects. First, it gave effective recognition to the importance of the logistic elements in the mission of the United States Army. Second, for the first time in its century and a half of life, the United States Army had pioneered a major advance in military education. From the establishment of its primitive Engineer School in 1776, down through the creation of a War

College and technical service schools under Secretary Root in 1901 through 1910, our Army had simply duplicated the practice of the armies of Europe. However, the Army Industrial College was the first college in the world dedicated to industrial mobilization and higher logistics education. Thus, 1924 may, perhaps, be remembered as the year the United States Army school system reached maturity, and became an object of imitation, rather than an imitator of other military training systems.

One of the brightest aspects of our participation in World War I was the outstanding accomplishment of the graduates of the two senior Army schools. General Pershing paid this tribute to the officers from the Command and Staff School and the War College: "During the World War, the graduates of Leavenworth and the War College held the most responsible positions in our armies, and I should like to make it of record, that, in my opinion, had it not been for the able and loyal assistance of these schools, the tremendous problems of combat, supply and transportation could not have been solved."

In addition to the establishment of the Industrial College in 1924, the Army reorganization of 1920 provided for a relatively complete system of service schools. These included Chaplain School, Field Artillery School, Signal School, Chemical Warfare School, Quartermaster School, Finance School, Ordnance School, Tank School, and Infantry School (which included the Tank School as a component element). With this reorganization, the Army school system began to be formalized, and took on a definite pattern resembling that which we know today. The Command and Staff School curriculum was built around four groups corresponding to the principal sections of the staff: administration, intelligence, operations, and logistics. The branch schools presented basic, company, and field officers' courses, together with a few noncommissioned officers' courses. This pattern continued without major change, or the addition of any other school, until the period of mobilization for World War II.

The memory of the Second World War is too fresh to make necessary any detailed discussion of the vast training requirements imposed by our Army mobilization, and the effort by which these requirements were met. In general, the Army school system, as established almost 20 years earlier met the challenge successfully. Facilities of the schools were expanded greatly. However, the basic solution to the need for a multiplied output was found in decreasing the lengths of courses, and eliminating unessential courses. The capacity of the officer candidate schools was greatly expanded during the latter part of 1941, so that by the close of 1942, a total of over 54,000 candidates were commissioned, an increase of almost 4,000 per cent in one year. The increase continued into the first quarter of 1943, and 58,000 men and women were graduated that year. By mid-1943 it was obvious that the production of officers would soon exceed requirements, and the program was cut back, in favor of increased training of officers in advanced courses. In the same way, school training of enlisted specialists equaled, and then passed requirements, and was cut back. In the summer of 1944, a general reduction in the programs and capacity of the Army school system was implemented. In spite of these cutbacks, large surpluses of officers were produced in some categories. The utilization of these men, through conversion training to fit them for assignment to branches in which shortages still existed, became a persistent personnel problem.

However, in spite of numerous shortcomings, and lack of completely coordinated control, the Army school system, during World War II, did a superlatively good job. The reorganizations of Secretary Root and the National Defense Act of 1920 had been remarkably sound, and the tremendous expansion of 1940 through 1942 had produced confusion, but no chaos. The success of the effort, and the magnitude of the accomplishment were universally recognized.

Winston Churchill, in 1946 said: "There have been many occasions when a powerful state has wished to raise great armies, and with money and time, and discipline and loyalty that can be accomplished. Nevertheless, the rate at which the small American Army of only a few hundred thousand men, not long before the war, created the mighty force of millions of soldiers, is a wonder of military history. To create great armies is one thing; to lead them and to handle them is another. It remains to me a mystery as yet unexplained how the very small staffs which the United States kept during the years of peace were able not only to build up the Armies and the Air Force units, but also to find the leaders and vast staffs capable of handling enormous masses and moving them faster and farther than masses have ever been moved in war before."

Perhaps the best short explanation of Mr. Churchill's mystery was given by President Eisenhower, when, as Chief of Staff of the Army he stated:

"No investment by the American Government has returned such tremendous dividends as the amount of money spent on the Army school system during the years between the two World Wars."

However, good as it was, the Army school system of the Second World War was far from perfect. Its most serious defects, as revealed by the test of combat, were its failure to produce an adequate number of senior officers trained to the highest command and staff responsibilities, and, particularly, the lack of effective provision for training in combined ground-air-sea operations, and operations with allied forces. In 1945, the War Department Military Education Board, to become known as the "Gerow Board," was created. As a result of its findings, which were supported by independent studies made by the Navy and the new Department of the Air Force, the system of Joint Colleges, composed of the National War College, the Industrial College of the Armed Forces, converted from the Army Industrial College, and the Armed Forces Staff College came into being. In addition, a number of temporary World War II specialist schools, such as the Army Language School, Army Information School, and Psychological Warfare School, were made permanent.

This, then, is the story in outline form of the Army school system. While many changes have taken place through the years since the establishment of the Engineer School in 1776, the history has been one of evolution to meet demonstrated needs. Although classification of long-term movements into neat chronological packages is always dangerous, I will, with your permission, revert for a few moments to my former status of history instructor, and rush onto the forbidden ground.

The history of Army school training may be divided into four periods up to the present. Perhaps we are now in a fifth period, but I feel that the perspective of time will be necessary to be sure.

The first is the dawn period from 1776 to 1898. During this long period, Army schools were created simply to train in certain essential skills, such as reading, writing, arithmetic, and the handling of ordnance. There was no system, and schools were largely local institutions.

The second period was the period of early organization from 1901 to 1917. In many ways this was the most important period of all. Through the inspiration of an unusually gifted civilian leader, and the cooperation of an understanding and skilled staff, the failures of the brief war with Spain gave rise to a comprehensive plan for a coordinated system of officer and specialist training through well-organized classroom instruction.

The third period is the period of national defense from 1920 to 1939. This was the age of a maturing Army school training concept, and the establishment of a school system to meet that concept. It saw the provision of the college-combat arms-technical service school pattern which persists to this day. Its schools developed sound doctrine, quality of instruction, and high levels of motivation among their graduates. Its success was measured by victory in World War II, and international recognition. For the first time, the United States Army school system was a pioneer and a model in military training, to be copied by the staffs of other nations.

The fourth period is the post-World War II period. I can only give you the first date: 1946. I feel no need to characterize this period to this audience. It has been our period, the period of world power and world responsibility for the United States and the United States Army. A mature Army school system has increased its emphasis on high-level officer education and technical specialist training. It has carried its full share of the system of Joint Colleges which devote their studies to the multi-element deployment of the armed strength of our entire nation, or of a grand alliance of democratic peoples. The new weaponry, the new communications, the shifts of world centers of power and political unrest all have their reflection in the work of our many Army and joint schools.

On the sound premise that a GS employee does not find any requirement for prophecy written into his job description, I will leave the predictions of things to come to others. Of one thing, however, I am certain: should the tragedy of war come again to America, the combat and technical skills, the motivation, and the leadership taught by the Army schools will, once again, be major weapons in the arsenal of democracy.

Thank you, gentlemen.

CHAIRMAN VALLANCE: I would like to thank Dr. Allen for a most interesting review, and in so doing reject at least two of his apologies. The one having to do with his being a social scientist is out, in the face of this excellent review. As for his dredging up the past, we need no apology there. As some sage has said: "In the soil of the past lie the roots and the trunks of the present, without which the flower of the future would never see the sunshine of the cosmos."

It is important to know the past so we can gain some lesson as to where we go from here.

I believe we have time for a few questions, if you would care to entertain them—let's say, five minutes' worth.

Dr. Poe?

DR. POE: I have a question. You spoke of a fifth period. Would you go into that?

DR. ALLEN: Shall we call the fifth period the age of Sputnik? This is the future. This is the important period. And I speak personally now: this is a period when the Army will determine whether it has a future. You gentlemen who develop the teaching and doctrine of the Army will determine if the Army will go the way of other obsolete instruments of power. Will the Army adjust itself to a new world—a world in which weaponry and political relationships, and the relationship of military to civilian are all very confused?

In this particular age there is a wonderful challenge, and I think that you gentlemen will be most important in the deciding whether the Army does continue its long history by adapting itself. It must adapt itself—in the words of Huxley—or die.

Does that answer your question, sir?

DR. POE: Yes.

CHAIRMAN VALLANCE: Another question?

CHAIRMAN VALLANCE: Well, thank you, gentlemen.

I am sorry for the rest of you conferees who will not for some weeks have a copy of the speeches to study in more detail. I have one.

Now, the time has come to eat. In your packet you will find a map which locates, but does not necessarily endorse, restaurants.

Our plan is to reconvene in another building, Stockton Hall, which is located on your map, and in the city is located on the next street behind us on 20th Street in the middle of the block. You will find room 10 to be an auditorium-type affair, where we will resume our activities at 1330 on the dot.

(The meeting was recessed and reconvened.)

CHAIRMAN VALLANCE: Come to order, please.

Having reviewed the background and present pattern of the U.S. Army school system, we will continue with the laying of background information against which to cast the rest of our proceedings with a view of the Army school system as run by our competitors, the Russians. This review will be presented by Dr. Robert L. Plumb, who is a Military Research Specialist on the Soviet Union, in the USSR Branch in the Office of the Assistant Chief of Staff for Intelligence, U.S. Army.

DR. PLUMB: I hope you will forgive me if I sit down. I don't want to be accused this early of talking over your heads.

Gentlemen, as you are aware the subject of Soviet military education is a vast one and, regrettably, for the purpose of today's presentation it must be necessarily limited both with regard to time and security considerations. But because of the nature of this conference, I shall attempt to devote most of the presentation to a discussion in general terms of the educational opportunities which are available in the Soviet Army Officers Corps. Unlike Soviet enlisted men, whose training is received primarily within troop units, the Soviet Army officer receives his training essentially from a comprehensive network of military schools and academies, which are established under the auspices of the Ministry of Defense. And let me say at the outset, should any points arise which I do not specifically cover,

I would be only too happy to take them up with you in detail at some time in the near future, if you could arrange a trip over to the Pentagon.

Before turning to the Soviet school system itself, I would like to preface my discussion with a few broad general remarks which I consider appropriate to Soviet military training as a whole, whether it be for the officer or the enlisted man. As you know, it is extremely difficult to compare any facet of the Soviet system with our own. However, if I may borrow an old cliche, I would like to say that Soviet military training may be regarded as based on three R's. In the case of the Soviets, these three R's are: repetition, realism, and repression. The first, repetition, may well be the natural outgrowth of a generally lower standard of education which exists among Soviet Army personnel, that is, in relation to our own Armed Forces. Consequently, military training, like civilian education, in the Soviet Union stresses the constant repetition of a fact until the individual soldier or officer is able to perform his assignment almost unhesitatingly, very much like a robot. Repetition rears its ugly head in many ways in military instruction. The average G.I. spends three years in the Army, and during this time he must repeat in detail the same annual training cycle three consecutive times with very little change from one year to the next. Officers, in their advanced military education, must undergo a considerable overlapping of subject matter throughout the various schools. This same principle of repetition, you may realize, permeates the entire life of any Soviet citizen, because this is the way his political beliefs are hammered into him.

The second R, or realism, probably results from the fact that the average Soviet citizen, whether he be a Russian, Mongolian, Uzbek, a Tartar or a Kazakh, is accustomed to a hardier, more primitive form of existence than his Western cousins. This also carries over into the military service, where rugged individualism under the watchful eye of the Politburo is demanded. Five months of field training, for example, are carried out by all troop units every year, under conditions which could resemble only actual maneuver periods in our own army. Physical conditioning is a necessary process. You may be interested to know that all Soviet Advanced Officers Schools and academies include required physical training and close-order drill for their officer-students.

The third R, repression, undoubtedly reflects a historical consideration, namely, the lack of individual freedom in Russia except for the privileged few. The average Soviet soldier, as I mentioned before, spends three years in the Army as an enlisted man. Officers serve for life. During this time the average soldier receives no leave—soldiers receive no leave during these three years, except for "compassion leave." At the most, he receives one five-hour pass every few months. Soviet soldiers stationed in Eastern Europe and lucky enough to receive a pass, are issued the following orders: Do not fraternize with civilians. Under no circumstances enter any private home, and do not chew or eat sunflower seeds in public.

Advanced Officers Schools frequently require that the attending officer leave his family behind at his previous station, and that he "bach" it throughout the course of studies at the school.

I should also like to mention a fourth R which is ever present in the Soviet military educational system. This R would be religion. By Soviet

religion, I am, of course, referring to Marxism, Leninism, Stalinism, or whatever you may care to call it. Under a Communist State, it is extremely necessary that proper conditioning of the mind be imposed upon all subjects, and nowhere is this more important, of course, than in the Army. Consequently, every soldier, from rawest recruit to most seasoned officer, must undergo regular prescribed political training. Enlisted men receive daily political indoctrination periods; Soviet officers, weekly training. All such training is under the supervision of devoted disciples to the cause, known as Zampolits, political officers. These are the outgrowth of the former political Commissar system. The Zampolits work virtually unhindered in their duties, and woe be to the military commander who dares to dispute this authority. And here, of course, I need only to cite the former Minister of Defense himself, Marshal Zhukov.

Political officers have a wide range of responsibility, and I might add that these men are generally resented by other line officers. Nonetheless, Zampolits advise military commanders, at all levels, as to their unit's political responsibilities. They direct both officer and enlisted men's political discussions, control all reading matter found in any unit, and may even maintain a network of informers. A former Soviet soldier relates an episode which occurred when he was on a wood-splitting detail. While splitting fire wood, he accidentally sliced off a bit of his left thumb. This incident was immediately reported to the Company Zampolit, a major, who went to the Company mess hall, secured a plate, put the sliver of flesh on the plate, took it to the Company orderly room and conducted an on-the-spot investigation to determine whether the Soviet soldier had been guilty of inflicting a self-wound in order to avoid further military service. You will note that throughout this entire episode the Company Commander was completely ignored and left out of the proceedings. The Zampolit's word was final.

Let us now turn our attention to the training of the Soviet Army Officer Corps itself. Throughout the history of the country, this group has been accorded a privileged status within Russian society. Therefore, it is not surprising that an orderly and efficient system of schools has been established at various levels. The Soviet Army schools, I might add, are generally patterned after the old schools which existed under the Czar's imperial system of schooling. The program begins at either Cadet or Officer Candidate School and then gradually progresses to Advanced Officers School and branch academies and finally to the foremost military institution in the Soviet Union, the Voroshilov Higher Military Academy.

It should be noted from the foregoing that the best Soviet officers attend, at the most, only two service schools after graduation from Officer Candidate School. Thus, while the number of courses which are available to Soviet officers is considerably less than in Western armies, this is in no small part compensated for by the fact that the average Soviet military school course runs three years as opposed to one year in our own army. Even so, there is no Soviet military school available to the average company-grade officer. Therefore, after Officer Candidate School, a line officer may serve for ten or fifteen years before becoming eligible for attending a branch officers' school or branch academy. This does not mean, however, that the Soviet officer goes without further training during his tenure as Lieutenant

and Captain. Besides on-the-job-training, an extensive program of evening or night study is organized within most troop units. The latest manuals and all the military publications, including the Army newspaper "Red Star," are required reading for the Soviet officer. Enrollment in correspondence courses offered by the different academies is encouraged, and political indoctrination and instruction under the supervision of the Zampolit are continuous.

Under Marshal Zhukov, political training of officers was given at the discretion of the unit commander. In fact, it was said that, during Zhukov's years as Minister of Defense, he required even the political officers to take close-order drill and basic training. Since laxity in political affairs was the main charge against Zhukov, his successor, Malinovsky, has obligingly issued a decree making it compulsory to give political instruction to all army officers, including generals and admirals. According to his decree, he even urged that additional time be spent on study of Marxism and Leninism.

Let us now examine the military school program actually available to Soviet officers. For select candidates, such instruction might begin at the early age of ten years with attendance at a Cadet school. These institutions, which are known as Suvorov Schools—they are named after the famous 18th century Russian Marshal Suvorov—may be compared generally to our own military preparatory schools. However, their schools are sponsored by the State, which provides free-of-charge tuition, boarding facilities, uniforms, and all textbooks. Suvorov Schools come directly under the Ministry of Defense. They were first organized by the Soviets during World War II to provide education and training for the sons of war-time heroes. However, now, within the framework of an alleged classless society, these schools appear to have degenerated into a training program for the sons of Soviet political and Army dignitaries. These schools provide a seven-year course of instruction comparable to that taught in Soviet secondary schools. However, they have added emphasis on military thought and behavior. Students may enter after completing three years of primary or elementary school. The staffs at a Suvorov Cadet School are frequently headed by a General Officer. The faculty is comprised of both military and civilian personnel.

The program of studies for Suvorov Cadets resembles that of the old imperial czarist schools. It includes one foreign language selected from English, French, or German, and mathematics, physics, chemistry, geography, arts and dancing, and even horsemanship. Of course, physical training and political instruction are continuous. In addition, the Cadets are naturally trained in such specialized subjects as army regulations, close-order drill, small unit tactics, motor vehicle driving and maintenance.

Graduates of the Cadet Schools are able to select whether they wish to continue their formal education in a civilian university or at an Officer Candidate School. Those who decide to go to a university automatically become members of the Army Officers Reserve Corps, but the great majority of Cadets choose to pursue a military career. Accordingly, they are ordered to Officer Candidate Schools without being required to take an entrance examination. They may even be permitted to choose their own branch of service. According to estimates, fifteen hundred cadets from those schools are graduated annually in the Soviet Union.

Officer Candidate Schools are merely an extension of a Suvorov Cadet's earlier training. These men attain an elite status after entering the Armed Forces. However, for most prospective officers, their attendance at the Officer Candidate School marks the beginning of their formal military schooling. The candidate must meet certain preliminary requirements. He must not be over 23 years of age. He must possess a minimum of seven years and preferably ten years of civilian education, must be politically reliable and pass a very rigorous physical examination. Candidates are usually drawn from three main sources, Suvorov Cadet Schools, noncommissioned officer ranks, and qualified recruits. Each branch of the service maintains its own Officer Candidate Schools, which are permanent garrison-type installations and are located in large Soviet towns. Each Officer Candidate School is headed by a commandant, usually a General Officer. As a rule, he is assisted by three deputies, one in command of the troops, one in command of the political department, and one, who as faculty director, is in charge of all instructors in the other departments of instruction. Each major subject taught in Officer Candidate Schools constitutes a department of instruction, and this is true of all Soviet officer schools. The following departments are usually common to all Soviet Officer Candidate Schools: Tactics, topography, social-economic, and foreign languages. The officer candidate continues the study of the foreign language which he began either in secondary or Suvorov School. Unlike the brief six-month Officer Candidate Course in the U.S. Army, the Soviet course runs for three years. On the other hand, it should be noted that the Soviet Army has nothing equivalent or comparable to the United States Military Academy. The closest equivalent of the West Point graduate, and not too close at that, would be a Soviet officer possessing both a Suvorov and an Officer Candidate School diploma.

Each of the three years in an Officer Candidate School is comprised of winter and summer camp periods totaling ten months. Daily instruction averages eight hours of classroom work, but on a relatively low level according to Western standards. Upon the successful completion of the final examination, the Candidate is commissioned as a Junior Lieutenant in the Army. Those who fail the final examination receive the rank of Senior Sergeant and must serve a minimum of six months on troop duty before becoming eligible to repeat the officer's examination.

As mentioned previously, there are no special schools as such for the training of Soviet company-grade officers. The Soviets regard the lengthy three-year program of instruction at an Officer Candidate School as all the training necessary for platoon and company commanders. Consequently, advance officer schooling does not come until the Soviet officer is ready for command duties at or above the battalion level. Such training is then provided either at an Advanced Officers School or branch academy. The basic difference between these two institutions is that the Advanced Officers School provides an abbreviated session of the branch academy course. Each branch of the service maintains several Advanced Officers Schools. These schools appear to be designed primarily for officers who are regarded as good field soldiers, but who have not shown enough ability to their superiors to be considered worthy of later promotion to high staff positions. The courses offered at Advanced Officers Schools, therefore, are intended to

train the student officer for command and staff duties only at battalion and regimental levels. Courses last one year, although each school generally conducts several courses at different levels during the same year. Thus, it is theoretically possible for a Soviet officer to attend the same Advanced Officers School on more than one occasion, but in practice this rarely happens. Appointments to these Advanced Officers Schools are made by regimental and divisional commanders according to quotas established by the Ministry of Defense. Advanced Schools are headed by a commandant of General rank, and he is assisted by the three deputies previously mentioned for the Officer Candidate Schools, one each for troops and for faculty and for political matters. Instruction is primarily of a theoretical nature with few practical or field problems. The main areas of study are political training, tactics and staff work, military history, and specialized studies according to the branch of service. Close-order drill, physical training, and language study are required, but these are of secondary importance. The candidates are examined in each major subject at the close of each course by a board of members from the military district. After graduation, they usually return to the units from which they were assigned at the beginning of the school year.

A military academy education is a virtual necessity for the Soviet officer who has ambitions of obtaining General rank. In fact, attendance at a military academy properly constitutes the single most important phase of the Soviet officer's military education. Each arm of service maintains one or two branch academies with the purpose of training its own officers for command and staff appointments from battalion through divisional levels. Of course, the best known of all academies in the Soviet Union is the Frunze Military Academy in Moscow, the highest infantry officer school available. In essence, it has no exact equal among the U.S. system of military schools and therefore may be said to be the rough equivalent of the U.S. Infantry Officers Advanced Course at Fort Benning and the Command and General Staff College at Fort Leavenworth. An academy course lasts from three to five years, depending on whether the student is enrolled in the command or technical curriculum. For instance, at the Frunze Academy, courses are of three years' duration. The students at the Dzerzhinsky Artillery Engineering Academy, however, undergo a five-year technical program. The Artillery, incidentally, has a second branch academy that offers the usual three-year course for Senior Artillery Commanders. An unusual feature of technical curriculums of branch academies is that they offer civilian graduate degrees in engineering upon the successful completion of classroom and dissertation requirements. Branch academies are organized similarly to the Officer Candidate Schools and Advanced Officers Schools. A General Officer serves as commandant with the usual three deputies. Regular enrollment at a military academy averages 400 officers, most of whom are majors. I would like to stress that in rank structure the Soviet major is the equal or the equivalent of our own lieutenant colonel.

Officers who desire to attend the respective branch academies must be above average both politically and in their service record. Any officer not over 35 years of age may volunteer for the admissions tests. These consist of two parts. First, the applicant takes an examination, which is given within the military district itself. Those who are successful in this

initial examination then go directly to the branch academy of their choice, where they take a second examination, written and oral. Those receiving the highest grades on this entrance examination are then enrolled as first-year students in the academy. Programs of study naturally vary according to the academy, with major emphasis placed upon the subject appropriate to the branch. Generally speaking, an academy command course would consist of political instruction, tactical training, staff work, military geography, military history, administration, and foreign language study. In addition, student officers are required to prepare two or more major research papers during their three-year stay at the academy. Senior students must take and pass a state examination prior to graduation. Upon graduation they receive assignments as Battalion Commander, Regimental Commander, and Regimental Chief of Staff. Residents of the academy are normally assigned to technical and service positions on regimental and divisional staffs.

The Voroshilov Higher Military Academy is the highest military institution in the Soviet Union. Its mission is to educate senior officers for divisional or higher commands, or for staff assignment at corps level; and the academy, formerly known as the Voroshilov General Staff Academy, is somewhat comparable to the United States National War College. The regular course of study at the Voroshilov Academy lasts two years and is attended by 100 to 200 select officers ranging in rank from Lieutenant Colonel to Major General. A one-year refresher-type program is also offered for Senior Commanders. There are only two qualifications necessary for admittance to the Higher Military Academy. There are no restrictions on age, rank, or length of army service, but students must be graduates of Frunze Military Academy or the Command Course provided by one of the other branch academies. Unofficially, candidates must be members of the Communist Party. Although party membership is not a formal requirement, it is virtually a necessity since the academy is under the supervision of the all-powerful military section of the Central Committee of the Communist Party of the Soviet Union. Organization and administration of the Voroshilov Military Academy are comparable to the branch academy. The studies are a continuation of those given at the Frunze Military Academy. Courses consist of military and political affairs; military history and foreign languages are primarily refresher training. Tactics are studied chiefly on an individual basis through a series of command and staff exercises. Probably the main subject taught is military operations at army and army group levels. Both offensive and defensive problems are solved by the group method in order to give training in the duties of an entire staff. A final examination is given to students by a three-man board. This examination period may extend as long as four months and the students at the academy schedule their own examinations within this period. The last month is devoted to the oral defense by the officer of his research paper, which must be written on some theme of military operations.

The importance attached to a Soviet officer's attendance at the Voroshilov Academy can be attested to by the higher appointments which its graduates receive at corps level and above. It is further borne out by a rather unusual practice. Student officers occasionally receive new assignments and must leave the academy prior to graduation. Although they do not complete their course of studies, and do not take the final examination,

they are none the less regarded as graduates of the academy and their names are inscribed on the academy rolls. That would be an easy way of getting an education.

From the preceding discussion, several points, I believe, are readily apparent. Since World War II, all newly commissioned officers in the Soviet Army have been products of the three-year Soviet Officer Candidate School System and many have had as much as an additional seven years of cadet training. Thus, all graduates during the past decade must be regarded as basically well schooled in both military and political subjects. This may have also been the Soviet approach to "complete professionalism" which General Wyman mentioned this morning.

Secondly, the opportunity for advanced military instruction is limited to Soviet officers. The average officer would probably attend only one ten-month course after Officer Candidate School. On the other hand, an outstanding officer can look forward to a total of five additional years of academy education.

And, finally, at least one-fifth of the Soviet officer's formal military schooling is devoted exclusively to political training.

CHAIRMAN VALLANCE: Thank you for showing us how the other two-thirds live.

We will have to move on with our schedule now. Our topic for the afternoon, as you notice, has to do with fairly large scope problems, goals of the school system and the program curricula and details of their manufacture and utilization.

A good many of the people in the group, I am sure, have had a great deal of experience in the preparation of kinds of instruction and courses, Army training programs and curricula. Normally this activity is undertaken as a part of a duty assignment which involves a good many other kinds of activities; again it might be fruitful for us to have an opportunity to partake of the views of another professional from outside the military system, one who has spent a great deal of time in the study of curricula, their development, their integration, their utilization and, as necessary, modification. And so we have invited to be our next speaker on this afternoon's program an educator from Columbia University, Dr. Ralph R. Fields, who will speak to us on basic principles in establishing a school program.

Dr. Fields.

DR. FIELDS: Curriculum development is one of the newer fields in Education. In reality, little in the way of systematic study of the problems involved in developing programs was undertaken prior to the 1930's. This field of study is perhaps best described by listing a few of the crucial issues in curriculum work: What shall be taught? How shall the program be organized? How shall learning experiences be guided? How shall student growth be evaluated? How shall program improvement be assured?

The principles which I will discuss have evolved from the study of college programs, particularly community colleges with their emphasis upon both general and technical education, and teachers colleges with their emphasis upon the professional preparation of teachers. I have the feeling, however, that you will feel a considerable familiarity with the problems with which I shall deal. It has seemed to me that four principles cover the most important points in program planning.

The first of these is that the nature of the program is dictated by the major purposes to be accomplished. This seems so sensible and self-evident that we won't have to spend too long in discussing it. For example, think of two schools. One is dedicated to the preparation of young ladies for their responsibilities as wives and mothers. We might call this one a "finishing" school or "charm" school. The other is dedicated to preparing young men for entrance into a city police force. Needless to say there will be considerable difference in the programs developed for serving these two quite diverse purposes.

Another less dramatic illustration would be the difference between two language programs, one to introduce college students to a culture different from their own, the other to prepare young executives for service in a specific foreign office of the business.

The first program is broadly conceived, calling for considerable language practice but with supplementary work in the literature, music, traditions and mores of the people. The second is likely to be an intensive, concentrated, highly motivated effort to learn to speak the language, much like those developed by the armed services during World War II.

Still yet another illustration of the fact that purpose dictates the nature of the program is the difference between educational systems that view democratic citizenship as the goal and those like the one we have heard described this afternoon. In our democratic system, for instance, we put great stress on the development of the individual. Because of this, the needs and problems and concerns that individuals have are one factor in shaping the educational program. Occupational demands are another, and of course citizenship responsibilities yet another. Our central focus, however, is the individual; this makes our school program basically different from that of the state which does not count each individual of unique worth.

Purposes must be clearly formulated, and they must be referred to constantly as the basic guide to program development. If the purposes are not stated clearly enough to serve this function, programs are likely to be fuzzy. Or if the purposes are not kept uppermost in mind as the program is developed, the result will be the same—a curriculum without central focus.

Purposes must also be used as the basis for evaluating the program results. Students should be tested in relation to those purposes, broken down into observable behaviors, skills, knowledge, and attitudes.

To sum up regarding our first principle: programs not only have to be founded on purposes, they also have to be evaluated and judged in relationship to them.

Our second principle is more complicated, for it deals with the involved problem of organization. It flows directly out of the first principle and takes us squarely to the heart of the basic curriculum problem. I have phrased it thus:

The program must be organized to accomplish its purpose, to fit the content, and in harmony with what we know about learning.

We have already discussed the role of purpose, so let's turn to the matter of content. The subject matter for any program has to be selected from an almost inexhaustible potential supply. Of course purposes play a part in this selection, but there are other factors as well. For instance,

what does the particular program maker happen to know in the way of subject matter? What does he like? What does he dislike? What teaching materials are available? Other factors such as timeliness, public opinion, and the efforts of pressure groups may be involved.

The content which is selected in turn affects the problem of organizing the program. For instance, let us think of the content which might be chosen for three different programs in Communication.

In one course, communication for the general student, with emphasis on writing, speaking, reading, and listening activities, the content might be current as well as classic reading materials, writing or speaking topics of general interest or common concern, current plays, movies, television and radio programs.

In a second course, one in scientific report writing, the content would be circumscribed by the purpose, limited to scientific materials. The emphasis logically would be upon exactness and preciseness as writing qualities rather than popular or interesting style.

In the third course, language analysis for the linguist, the content would be the objective study of language for all purposes.

In each case the nature of the content would influence the method of organizing the work. A variety of approaches would suit the content of the general communications course; the second, scientific report writing, would call primarily for the preparation and analysis of such reports; in the third, the organization might well be the problems of language as discussed by the scholar.

Through these examples, we see that both purpose and content affect organization. But the identical content might be organized in several different ways. For instance, in the first course, communications for the general student, the method of organizing could be around such processes of communication as reading, writing, and speaking; or it might be around such problems of communicating as correct usage, standards, audience appeal, etc., or based on individual projects, or on group undertakings such as the production of a play or a literary magazine, the analysis of propaganda, or the like.

How a program is organized depends a great deal on what is believed about the way people learn. For instance, if it is believed that the most efficient learning is to study organized knowledge and then apply what is learned when it is needed, a logical subject matter organization is clearly indicated. On the other hand a quite different organization would be indicated if the learning beliefs should resemble the following statements:

All behavior is learned and therefore all learning must be related to behavior; behavior is purposeful and consequently all learning is purposeful; learning is discovery by the learner of a successful way of meeting a problem; the learner learns many things at the same time; and finally, purposeful and meaningful learning is highly permanent.

We have examined separately how program organization is affected by the purposes of the school, the nature of the content, and the beliefs regarding learning. How can these factors be coordinated into an effective program? Fortunately certain factors seem to be associated and thus help in formulating a program pattern. For instance, professional schools are geared to serve occupational goals. The content selected in these schools tends to be that

which is related to occupational competency. Many of the teachers working in professional schools have had experience in the careers for which the program prepares; hence they are likely to be job-minded and action-oriented. Psychological theories of learning which stress problem-solving activity appeal to them as realistic. Thus in building programs the tendency is to organize programs around tasks or jobs or problems or operations. Such an organization brings purposes, content, and methodology into a harmonious whole.

It is interesting to note that there is also a certain harmony between purpose, content, and method of organization of graduate programs work in the arts and sciences. The purpose is the development of the scholar; the content is the knowledge which has been organized into the discipline which is to be studied and mastered; the tendency of the scholarly professor is to believe the psychological theory which relates to the mastery of subject-matter rather than to the behavior of the practitioner. Consequently the purpose (scholarship), the content (the academic discipline), and the beliefs regarding learning all lead to a program organized into logical groupings of subject-matter.

This contrast is much too simplified to be precise and exact, and there are many exceptions—for example, professors in professional schools who cannot bring the knowledge in their field of scholarship to bear on the problems of the professional worker, and professors in graduate schools who organize their courses in an other-than-logical manner. There does seem to be, however, a considerable amount of evidence from the day-by-day program development in colleges to support the belief that the three factors being discussed do influence the nature of the instructional programs in a substantial manner.

Our third principle states briefly that those who are concerned with the program must be involved in its development.

This appears rather innocent on the face of the matter, but there are problems which surround its implementation. If we phrase the principle in the form of a question we can immediately see some of the issues involved. The question might be put as "Who plans the curriculum and what role should different groups play in curriculum improvement, especially the faculty, the students, the administration, and the public?"

Faculty participation in program planning has rapidly become the procedural mode. Curriculum committees are commonly charged with the task of stimulating, inaugurating, guiding and implementing program innovations and improvements. Proposed changes are discussed and debated by the faculty groups with whom the responsibility for the program rests. The problem of how to organize the staff for effective program planning plagues many a faculty, as does the question of how to free faculty time for this important work.

The role of administration in program improvement is uniformly recognized as an important one, but it is discharged in many diverse ways—through edict, by encouragement, by engaging consultants, by freeing the faculty for intensive curriculum work. It seems patent from the principle of involvement, however, that the role of administration is to stimulate and guide the faculty, for in the last analysis the instructors have to be the most intimately involved because they are the most intimately concerned with making the program effective.

The role of students is hard to generalize, for in different programs student involvement takes very different forms. In some institutions students serve on curriculum committees, thus sharing their reactions and suggestions directly with the faculty and the administration. In other programs, students are consulted and studied rather than requested to participate directly. In still others they are analyzed but not consulted, while in some there is every indication that the students themselves have been completely ignored.

Regardless of the manner of involvement, however, if we believe that purpose is an important ingredient in effective learning we will do everything possible to recognize student purposes in formulating the program, and will take advantage of every opportunity to help students identify the way the program contributes to the attainment of their goals and ambitions.

This last observation leads to the major implication which this principle of involvement connotes. Just as students in order to put forth their best efforts at learning tasks must see them related to their own goals, instructors in order to contribute their best teaching efforts must be able to see the relationship between their individual work and the total program.

Our final principle is that program improvement rests upon experimentation and evaluation.

In my opinion experimentation must go on constantly if programs are to be improved. Undertakings may vary from an arrangement which a single instructor makes to conduct a bit of action research to try out an idea or to check a new procedure, to the carefully organized efforts of an entire faculty to experiment with a new program. Regardless of the size or extent of the particular project, however, the spirit of experimentation is essential for progress.

The other essential, evaluation, includes both the measurement of student accomplishment and the testing of program results.

Student accomplishment must be measured in all appropriate ways, including, wherever possible, actual behavior in realistic situations. For, in the last analysis it is only to the extent that people change in their behavior that they have really learned. All other evidence is peripheral and the true extent of learning must be deduced or estimated.

However, programs can be evaluated in other ways than measuring student learning directly. For instance, graduates can be followed up to see how they perform on the job. This may well be the best single measure of the effectiveness of a program, but since it involves the lapse of considerable time, and because many unrelated factors can influence a person's career, other more immediate evidences should be gathered too. Authorities can evaluate program features; faculties can undertake self-appraisal studies; student opinion regarding the program can be helpful.

* * * * * *

Let me close by making a quick review of the basic principles which have been proposed. In a sense we have completed a full circle. We started with the principle that the nature of the program is dictated by the purposes. Our second principle was that the program must be organized to accomplish its purpose, to fit the content, and in harmony with what we know about learning. Our third indicated that all those concerned with program improvement had to be involved in the process of carrying out such changes. Our

final principle brings us back again to the primary purpose as the basis for evaluating the effectiveness of the program in action.

CHAIRMAN VALLANCE: Thank you so much.

Again, I am sorry that the rest of you do not have access to the printed version of the speech, but we will get it to you as soon as we can. I have a few administrative announcements to make before we move into the rest of the activities of the afternoon.

(The Conference adjourned for Group Discussions.)

(The Conference reconvened following Group Discussions.)

CHAIRMAN VALLANCE: Can we reconvene and get on with the show, please. Now, I am apologetic for the short time which was available for the transaction of the group discussion business. Tomorrow we will have a full two hours, and I trust we will have a coffee system which will produce a higher rate of flow per minute.

Our procedure for the running of the summary sessions now—and today's will necessarily be an abbreviated version—I propose as follows (we will try it and see how it works): that we will call on Group 1 for a quick report, followed by a few minutes of questions or discussion on it. If there are recommendations or major highlights to be noted, we will ask as a matter of information—nothing official—for an expression of consensus on some of these highlights. We will see how the time goes and see if it will allow this sort of procedure.

Now I would like to call on the reporter for Group 1.

I see it is Dr. Vineberg.

DR. VINEBERG: Group 1 was concerned with the topic, "Determining the Essential Elements of a Course with Special Reference to Courses for Technical Subject Matters." What I would like to do is briefly run over eight or nine comments which we received from the floor during the discussion and then give you the general consensus or recommendation from the total discussion.

The first remark from the floor suggested that the Army Educational Program be used to a greater extent as a prerequisite to reduce the scope of some of our present technical courses.

Second, it was suggested that courses contain only what is necessary contentwise at the time that the course is given, and not include prerequisites common to whole groups of courses.

Third, we talked about MOS's and job descriptions, and MOS versus real job descriptions or job profiles, pointing out the real discrepancies that exist today in MOS's.

Also it was mentioned that focusing on the MOS tends to put more or introduce more theory than necessary into most courses.

The fourth remark from the floor suggested that we all take a look at the Air Force QPRI program because their methods and techniques are being found particularly effective by the people at the Ordnance School at Huntsville, Alabama. It was also pointed out that the training people involved

in such an effort as the QPRI must work in the R&D stage right along with the development of the equipment.

One of the particular virtues of this, or things to watch out for if you don't have people working in the R&D stage, was that you won't develop also the hardware that you need for training.

Let me phrase that the other way around. In order to develop necessary hardware for practical application and training, you need more training people working in the R&D stage.

A MEMBER: What is the QPRI?

DR. VINEBERG: Qualitative Personnel Requirements and Information, I believe.

A fifth comment from the floor told us a little bit about the Navy technique on the development of Polaris, where they have combined job analysis and selection analysis to work as a team, to work also during the R&D stages, and pointed out that job changes and descriptions of jobs change throughout the R&D process.

A sixth comment indicated our traditional or up-until-now neglect of on-the-job training—more or less that we have bowed to formal training, pointing out that the school exists to give a man a head start or a jump on the job. If it does not do this, it does not serve its purpose.

Another comment or suggestion, and a fairly unanimous one, was that a job profile must be quite specific to the job.

And a final comment involved the proportion of "how" and "why" content that goes into a course, the "how" being presumably practical content and the "why" I will interpret as being the theory of the course.

Now, the principal problem that seemed to come out of the discussion this afternoon, or principal recommendation, is that we need a lot more looking at and a lot more work on the development of adequate definitions of jobs, job descriptions in the form of MOS descriptions, and job descriptions in the form of the researchers' job and analyses or job profiles. This identification and description of jobs occur right back at the beginning during the R&D stages of development of our equipments. It may well be that with more adequate description of jobs, a lot of our training problems themselves will disappear, particularly such a thing as how much of the "how" and how much of the "why" as far as content for technical courses is concerned. The problem itself may almost disappear with adequate job definition.

Are there any questions?

CHAIRMAN VALLANCE: Yes. Would you let me ask again: What is the meaning of "Qualitative Personnel Requirements and Information"? I am not sure all the people in the audience are familiar with that concept.

DR. VINEBERG: It is a system whereby job descriptions, selection requirements, complete information about all of the jobs that will be necessary for a new system are provided and developed during the development of that system.

Are there any other questions?

A MEMBER: Will you expand a little bit on the relationship of HOAT to resident training? What is the relative effectiveness of each?

DR. VINEBERG: I do not think the group had much to say about relative amounts, only that resident training had to satisfy the requirement of preparing the man for the job, more rapidly building in the requirements

of the job; and if it did not do that, why the man could probably just as well get them on the job in many cases.

He would have to show a real dividend, let's put it that way; otherwise it did not serve its function.

Are there any other questions?

CHAIRMAN VALLANCE: Were there some specific recommendations that were made?

DR. VINEBERG: No, no specific recommendations, only the general one that we take a greater look at "job definition," "job analysis," and "job description."

CHAIRMAN VALLANCE: With this I take it there is little argument.

COL. RAY: I wonder if I might add a little comment. This greater look must be where there is an inflexibility of the soldier to perform some other soldier's job. Perhaps an unrelated MOS is considered.

A MEMBER: Does your group have any specific ideas on how we will use the Army Educational Program to put down the scope of these resident courses?

DR. VINEBERG: Let me turn that question over to Colonel Ray, who is the gentleman that just spoke.

COL. RAY: I think that a gold mine has been found during the past year, and those of you who may be from Bliss could be more definitive in describing what I think has been found.

I am told that 46 per cent of the entering enlisted students in maintenance courses at Bliss in 1956 failed the courses, at least one kind of course. I am not certain, as a matter of fact, precisely. To overcome this tremendous attrition in 1957, the Commanding General and the Commandant at Bliss urged commanders that their company battery commanders use the Army educational courses—I see we have Colonel Cummings from Bliss here who can perhaps state it more accurately—that by using this pretraining, attrition has been reduced substantially toward zero. I commend, if I am reporting this correctly, this use of the already built-in education for welding or for any kind of course that is now being run in a service school. Use your Army educational course either as a substitute or as a prerequisite, a kind of pretraining, to save school time.

Colonel Cummings, am I anywhere near right?

COL. CUMMINGS: The attrition rate was never as bad as 46 per cent, but we have not brought it down to zero yet.

In general, what we did was recommend that they encourage that the students take at least algebra and at least some trigonometry. And equally important, we gave them what we call an electronics placement test, which is a measure to determine whether the man has any capabilities for that type of study. This did not work because they did not send people down who would not get a certain score in that test.

It does work in the field. They tend to either eliminate those who have no capability or to help those whose background education is a little bit weak. It has reduced our attrition to a figure in the neighborhood of 15 to 18 per cent right now.

CHAIRMAN VALLANCE: Thanks, Dr. Vineberg. I think we must move on to Group 2.

May we call on Dr. Pickard.

DR. PICKARD: Group 2 discussed "The Influence of the Common Subjects Letter." In order to conserve your time, I refer you to the bottom of the first page and the second page of the Discussion Group Notes. This material will give you an idea of the scope of the Committee's discussion.

In general, the members of the group were in agreement with what is stated there. There were a few other points raised. For instance, the statement was made that the insertion of common subjects tends to destroy the continuity of the presentations and results in course jerkiness—that perhaps this inclusion is the result of personal interests along the line.

The basic difficulty expressed was that its inclusion restricts or limits the time that might otherwise be spent in branch training. This comment was answered with a statement that "overemphasis on branch training may lead to overspecialization—after all, an Army officer is supposed to be more than just a specialist. The objective of common subjects is to ensure this broad training." This purpose is a major concern of the Commanding General, CONARC.

It was also answered with the statement that the lessons that were required by CONARC were prepared by the respective service schools, which considered these subjects necessary.

One basic objection raised to the CONARC letter was that it is not sent out in time, and the program of instruction is already prepared by the time it arrives.

To put it briefly, there was considerable discussion concerning each of the items on the discussion outline. It was very well covered and we finally arrived at three fundamental conclusions, with recommendations. I think you will be interested in them.

1. We have no real quarrel with the Common Subjects letter, except that it comes out too late. The recommendation is to make it more timely.

2. We detect certain elements in the Common Subjects letter that are hard to live with, such as the repetitive nature of the basic subjects. They are at times boring because they are of this repetitive nature. Furthermore they are too authoritative and are broken into a number of small packages making them very difficult to integrate. We recommend that CONARC give some consideration to providing more flexibility. Instead of saying we can just change it 25 per cent, consider some flexibility in that figure.

3. The third conclusion is that the common subjects required in the CONARC letter are not always in consonance with the stated purpose of the course. The Committee's recommendation is that if a common subject is not in consonance with the purpose of the course, do not require the Service School to include it.

How shall the Service School determine if it is in consonance? By including in the Common Subjects letter the stated purpose for teaching each common subject. This procedure will assist the director of training, or whoever is charged with the preparation of the program of instruction, to determine whether or not the subject should be included within the limits of flexibility that have been established. In essence the Committee recommends that the common subjects tie in with the purpose of the course. If they do not, get rid of them.

CHAIRMAN VALLANCE: Any questions on this topic? If not, we will move on to Group 3. I see Dr. Cisin is the reporter for that group. Their topic was "Developing a Program of Instruction with Maximum Integration and Internal Consistency."

Dr. Cisin.

DR. CISIN: As might be expected at the first free talk session of the conference, our discussion covered a good deal of ground, including the subjects listed in the program and some of the items listed in the outline provided by the discussion leader.

We started with the idea that maximum integration and internal consistency are facilitated by (1) the clarity of purpose of the program and (2) cooperation among the faculty members, that is, the faculty works together, the courses are planned so that the relationships among them are conscious and not simply unconscious duplication.

Integration and internal consistency, it was held, are personal matters with the student. The learner must integrate the program for himself. No amount of planning for an integrated program can guarantee that all or any of the students will organize diverse material for themselves. All one can do in planning is, as far as possible, to help the students to perform the integration process.

The question was raised about the difference between military and civilian education. To what extent is there a difference between voluntary and involuntary students? The problem was phrased in terms of the amount of effort devoted to relating the course to the individual's goals. Obviously when the student is oriented to civilian life rather than to the objectives of the course, there is a major problem. This problem is greater with enlisted men than with officers.

Pursuing the question of student motivation, we talked about motivation through pertinence, which is our main subject; motivation through fear; motivation through the desire to cross hurdles; motivation because of duty and responsibility; and so on.

We moved, then, to the question of the purpose of military courses, the objectives of each individual course.

In general, the purposes of military courses are stated by regulation. These purposes are stated broadly. In at least one instance, and I gather in many others, these general purposes have been broken down into specific course objectives which appear in the program of instruction.

We moved, then, to the problem of heterogeneous instructors and their interpretation of even well-stated objectives, and particularly to the problem of instructor motivation.

We learned about the instructor training program of the Marine Corps, which involves a two-week course in the principles of teaching, orientation on the purposes, mission, and organization of the schools, and practice teaching. This is followed up by monitoring and inspection, and by reports written by the instructors after they have instructed. It is further followed up by student evaluation. I gather that what was said was not at all unique to the Marine Corps, that many Army schools had very similar programs.

Turning to the specific problems of educational advisors, it was perfectly clear that there is considerable frustration on the part of some educational advisors, because of turnover of commanders who are

empowered to make decisions which are at least sometimes viewed as educational or professional decisions.

The trend of the discussion at that point was that there are frequently no sound bases for some of the decisions that are made on course length for example, no sound bases for such decisions even among the professional educators.

This led us to the problem of upward communication from the professional educators, that is the educational advisors, up the chain of command. It was generally agreed that courses should be planned by educationally qualified men. We noted a need for better understanding up and down the channel. One of the major problems that was pointed out was that the military decision-makers turn over rather rapidly at CONARC and the Department of the Army. One of the main functions of the educational advisors, it was agreed, is to provide continuity; but, perhaps even more important, a function of educational advisors is to provide professional competence in the field of teaching.

We closed on a note that apparently was struck in other sessions as well, that the school is removed from the field. There is a barrier between school and field. It is hard for the people at the school to know what the objectives of courses should be. They need more information on the duties, on the requirements placed on the men whom they are training.

CHAIRMAN VALLANCE: Will there be some discussion or questions regarding the transactions of that particular group?

Would any group members like to clarify any of it or extend it, I should say?

DR. KARCHER: I feel a slight compulsion to comment on the last point made here and combine it with a comment on Group 1.

First, let me identify myself as Karcher, from the Personnel Research Branch, since I am in rather strange quarters here.

This problem of what the actual duties of the men are, as would be expressed in the job descriptions, is extremely critical today. I think that all technical schools are having a very difficult problem in determining even the most elemental aspects of course content. I think that you are going to have to live with a certain amount of this difficulty and that, for one thing, going into the R&D phases of the development will not be an immediate solution to your difficulty.

I happened to have worked fairly closely for a brief period with some of our engineers working with some of our larger missiles, and I think it is safe to say in generalization that about six months before a training program had to be developed, these engineers had not the vaguest idea as to what kind of equipment would be used on an operational missile. This was just a matter of working out the final details. The engineers were not concerned with it until the decision was made to convert it into an operational missile. From their point of view it was not possible to determine at that time what operators were going to have to do, in terms of a sequence of operations; or how the equipment could be handled; or even how many people would be needed, let alone specific allocations of duties to individual members of the operator team.

Because I think you are going to have this as a continuing problem from here on out, I think that a lot more attention has been paid to this area

than would have seemed to have been implied from both the comments of the first group and also this latter comment. It should be recognized as an area in which a great deal could be accomplished, but I think one should temper the problem a little and recognize it probably will be with us for quite a few years.

CHAIRMAN VALLANCE: Any comment on that?

DR. CISIN: No, I cannot disagree with you. I think most of the members of our group would tend to agree.

I think that we were speaking from a position of weakness in emphasizing this point. The schools get very little information back from the field. As I said to Dr. Fields when the session closed, this is one of the old standards that is posed every time people like us get together, and it should be. Even if it may never be possible to get completely adequate information, it is necessary that we keep striving toward this objective.

A MEMBER: I would like to comment a little further on that if I may.

It seems to me that we have two entirely separate problems on the feedback from the field to the school and the feedforward from the system under development to the school. Now there are problems in both of them, but they are different problems.

With regard to when to start the infeed from R&D to the new weapon system and its requirements for training, I have heard a thousand times, I think, that going into this now is premature. I can never accept that, that going into it now is premature, that you must wait until the engineering is completed before you can define the job.

It is true that you cannot tie down, even after the engineering is completed, what the job requirements are going to be, let alone how you are going to train unknown men to do it. But unless a training man is in at this stage of the development, you are going to get more of a "Willie Westinghouse" development than you can train for; because if he is in, he will point out that you are running into these troubles and you will get a more acceptable, maintainable, trainable equipment or system as a result. So there is a feedback from the training man and the psychologist to the very engineering development of the system feeding up to, we hope, a really effective weapon system, man and hardware.

Now, I did not mean to wave a flag on that speech.

While I am on my feet, I would like to bring into this another tie back to the first group. Some reference was made then to the "how" and the "why." The question raised there, as reported, was "How much?" But I think that this group needs to consider also "How related?" And I think that the "how" needs to be re-enforced by the "why." It is not a question of first this, then that, or really how much of each. Basically for a job he just needs to know "how." He has to be able to perform. The more he knows of "why," the more effectively he will perform. But these things must be integrated and developed, re-enforcing each other.

CHAIRMAN VALLANCE: Thank you. You have effectively, I might note, highlighted the procedure of qualitative personnel requirements and information in your first remark, in case you want to make a note of that; and I think no one could disagree with your second major point—i.e., the essential of "why" a thing operates the way it does may not be so essential to the man who has to turn the knobs and read the dials, but it may add

something to him to develop his skill along similar bits of equipment and later on in his tenure on the job.

I think we had best turn now to Group 4 for a quick summary before we adjourn.

Mr. George.

MR. GEORGE: Before getting on with the report of our committee, I would like to ask the Committee on Arrangements if there was anything deliberate in assigning this stepchild of the Army School System—its extension course program—to the cellar?

Before getting into the details of the report which our committee plans to submit on its topic, "The Design and Management of Extension Courses," we think possibly it would be proper to focus the attention of the conference specifically on what this area comprises.

First of all, a service school's extension course program and its nonresident program are not synonymous. Extension courses comprise what may be a considerable portion of a service school's activities in its off-campus activities but in no service school does its nonresident mission terminate with its extension course program. Other significant facets of a service school's responsibilities in the nonresident field, which we might call to your attention, include its support of such programs as the U.S. Army Reserve Schools, the Reserve Officers Training Corps, training of branch units in the Regular Army, the National Guard, and the United States Army Reserve; and its support of such programs which are conducted for and by branch augmentation units and industrial-associated units in that particular branch or arm of the service. At the typical Army school, these missions are all generally consolidated within the mission of a department of nonresident instruction or a similar organizational unit.

During the discussion this afternoon, we mean to focus our attention only on the extension course activities of the department of nonresident instruction at a typical service school.

First of all, I would like to indicate the scope of that program. At the present time, there are 23 service schools offering 19 company-officer and 19 advanced-officer extension courses. At the company level, this means that there are about 600 subcourses comprising a total of about 12,000 hours of instruction administered to these individuals through correspondence. At the advanced level, there are some 588 subcourses comprising a total of in excess of 12,000 hours of instruction. Of the total enrollment as of the end of the last calendar year of 150,290 students, we had about 27,000 officers enrolled at the company level; about 18,000 officers enrolled at the advanced level; and about 43,000 enlisted men and other qualified personnel enrolled in the precommission extension course. This means that there were about 66,000 or 67,000 people enrolled in special courses conducted by the various service schools in the Army.

How do these students operate? How much work do these 150,000 students accomplish? Well, the latest figures issued by CONARC indicate that the average officer completes about 8-10 credit hours of work per month. In order to remain actively enrolled, they are obliged to complete 30 credit hours of work per year.

In these days of tight budgets, large reductions in spaces, and serious curtailment of dollars, our committee would like to recommend to the

conference that the economies of extension courses be considered. It is our opinion that equivalent instruction with respect to content and quality can be provided on either a nonresident or resident basis. The compelling factor to be considered in the selection of method should be the relative cost.

Studies completed in 1956 by the Industrial College of the Armed Forces, and later verified by studies completed in several of the service schools, indicate that instruction by extension course methods can be provided at something less than $1 per credit hour. This becomes especially significant when we learn from the same report that in resident programs, similar instruction costs between $17 and $25 per hour of instruction.

This, we think, is important. It is not submitted as a criticism or as an indictment of the resident school system. Both methods, we feel, have their place in the Army School Program. We merely submit that the relatively recent upsurge in interest in the extension course program—not only by the military but also by colleges, universities, and industry—is not accidental; rather, it is the result of some cold, sober analysis of the facts.

Now, the findings of the committee comprise largely recommendations relating to the need for additional time in order to effectively consider the areas which were proposed in the outline. Specific comments were made relating to more extensive use of prerequisites as an enrollment procedure; more and extended use of mechanical equipment in scoring, grading, and recording operations in the nonresident programs of the school; and in a more realistic approach to restricting extension instruction to nonclassified materials.

Now one last thought: a dynamic, realistic extension course program is impossible without the alert leadership of an aggressive director. This officer is the key which spells the difference between a progressive, growing, alive program and one that just never manages to get off the ground. Because this job is critical to the service school support of our forces, not only in the reserve components but also in the regular establishment, we would request appropriate commanders to use extraordinary discretion and judgment in making the assignment of this individual. With an alert, enlightened, energetic, progressive director, the program flourishes; without him, it withers on the vine.

CHAIRMAN VALLANCE: Are there questions on this presentation?

A MEMBER: You are a fine salesman for nonresident training, I must say. I do not want to detract anything from the nonresident program; it is very important. But I think your facts and figures can bear a little looking into.

For example, you say it costs $17 to present—

MR. GEORGE: I have not said it, I am repeating a report that was made by the Industrial College of the Armed Forces in 1956.

A MEMBER: But the point is—without the resident instruction, you would not have the nonresident instruction. Because basically what you do is take the resident instruction and send it out. That cost is $1 per student.

MR. GEORGE: This, of course, is not a standard procedure throughout the Army School System. There are several service schools that have specifically organized departments that prepare the instruction which you suggest is prepared in other schools by the resident departments. This is not a general procedure.

A MEMBER: Is that figure, $17, just based on the Armed Forces own courses? Do you know?

MR. GEORGE: This is an Industrial College of the Armed Forces figure, yes. But other studies in other service schools indicate similar or lower costs and in general support the study mentioned here.

A MEMBER: Working on the presumption that your figures are correct, I wonder about this recommendation that you go even more toward the mechanical equipment—in other words, treating the student as, more and more, a robot and getting the person away from it, when it is so much cheaper already.

Are we going to take something that is cheaper and make it still cost less? Don't we have here a good case for improving the caliber of the instruction now offered through extension courses?

MR. GEORGE: I think there is much to what you say. I certainly wouldn't dispute the recommendation that we go further in that direction. This is preferred. If we accept our present costs then further savings should be invested in improving the quality of our instruction.

CHAIRMAN VALLANCE: Thank you, Mr. George.

The time has come when we can adjourn from here and move over to Lisner Lounge again where we began this morning for the reception. We will reconvene in this room at eight-thirty in the morning.

(The meeting recessed.)

THIRD GENERAL SESSION

Wednesday, 29 January 1958

Assessing the Outcomes of Military Education

CHAIRMAN VALLANCE: Gentlemen, we have reviewed the background and present pattern of the Army school system and discussed basic principles in how one goes about setting up a school program. This morning we turn our attention to questions of evaluating the products of an educational program—how well are the objectives which we have established being pursued by the methods which we have chosen. Our lead-off speaker for this session is a man who has spent a great deal of his career in dealing with such problems as I have suggested. He has dealt with such problems in several contexts, both military and civilian, and is recognized as one of the country's authorities in educational measurement and evaluation. I am pleased to present to you Dr. Robert L. Thorndike, Professor of Education, Teachers College, Columbia University.

Dr. Thorndike.

DR. THORNDIKE: Evaluation in education means describing something, in terms of selected attributes, and judging the degree of acceptability of that which has been described. The "something" that is to be described and judged may be any aspect of an educational undertaking, but it is typically either (a) a complete school program, (b) a curricular procedure or innovation or (c) an individual or group of individuals.

If we examine the definition of evaluation that I have just given, we see that it calls for three types of activities. The first is selecting the attributes in terms of which the enterprise is to be judged. Before we can tell whether we have a good apple, we must know whether we want one that is sweet and juicy to bite into or one that will keep until March in the root cellar. The first step in any program of educational evaluation is one of identifying and describing the goals that we are seeking.

After we have agreed upon the qualities that are important—in our apple or in the graduates of our school—we must develop ways of observing and reporting the extent to which any specimen exhibits the qualities that we are seeking. We can bite into the apple and taste it, or we can check on its firmness and crispness as possible indicators of its durability. We can test

students for knowledge and skills by any of a variety of techniques which we shall need to examine later this morning.

Finally, we must make a judgment of how well the object meets our specifications. The apple tastes good, or it is too sour, too flat, or too mealy. The graduates from an experimental curriculum diagnose malfunctions more correctly and repair them more quickly than those trained in the previous standard curriculum, or they do not.

Let us consider each of the three components of the evaluating process in somewhat greater detail.

A program of educational evaluation can be no better than the analysis of educational objectives from which it takes off. Only insofar as we have made a sound analysis of the outcomes that we are seeking from our instruction, can we hope to tell whether or not our program is being successful. This seems so elementary and basic that I hereby apologize for mentioning it, and yet at the same time the point is so fundamental that it can hardly be overemphasized. You cannot tell whether you got there unless you knew where you were going!

Of course, curriculum planning equally depends upon a sound definition of goals and objectives. You also cannot tell which way to head unless you know where you want to end up. In fact, curriculum planning and educational evaluation must walk hand in hand down the same road—the road that we shall be able to seek out only after we have determined our destination.

Unfortunately, though, there are no simple road maps to point the way to our educational goals; and again, unfortunately our goals cannot be expressed in terms of one simple destination. The ultimate destination may be clear—to maintain a military force that can protect us, deter all aggressors, and implement our national policy. But the way stations along the route that represent immediate and intermediate goals for a photo-interpreters school, or a diesel mechanics school, or a combat infantryman school are less global, more varied, and less immediately obvious.

The first step, then, which should claim the most careful assembly of evidence and the most thoughtful evaluation of that evidence, is the step of analyzing and stating the goals that are being sought in a particular training program. Ideally, what should the graduates of school X be like? What should they be able to do? What should they know? Yes, even what should they feel?

In public education, we rarely lack for statements of goals and objectives. Every school system that has prepared a course of study has probably prepared a glowing statement of the outcomes that are supposed to result therefrom. The course of study is designed to yield knowledge, skills, understandings, lead to better citizenship, improve ability to use the scientific method, produce well-adjusted personalities, and cure flat feet. Seriously though, the typical statement of educational objectives leaves much to be desired as far as the educational evaluator is concerned. Generally, the goals are stated in such a global way, are expressed in such ambiguous terms, or are so remote from what a graduate of the school can be expected to <u>do</u> that they are of very little use to guide either curriculum development or evaluation procedures.

What qualities do we want, then, in a statement of objectives for an educational program? To provide a sound guide for educational evaluation,

a statement of objectives should be authoritative, complete, specific, and behavioral.

The statement should be authoritative. It should be based on the best possible sources of information, and the most insightful analysis of them. In the Army context, this means a continuous campaign to relate educational objectives to the realities of military tactics and operations. What will this radar mechanic or that tank gunner actually be called upon to do in his operational assignment? What does he really need to know? What skills will he have to display?

The statement should be complete. It should include all significant aspects of the job. It should take account of the fact that the man will be a soldier as well as a specialist, that he needs to know what he is fighting for as well as how to fight. Completeness implies balance, however. It implies a weighting of importance for different outcomes; not merely a listing of them. It means recognizing the main chance, and not so cluttering up either the curriculum or the evaluation with a host of incidentals that the main objective gets all but lost from view.

The statement should be specific. How much help do we get from the statement that a second-grader should "have an understanding of his immediate environment" and should "practice democratic skills of participation?" We know much better how to go about evaluating these if we express them as "should know how to get to the grocery store, post office, etc., and what you go there for," or "keeps quiet when another child is talking to the group, and speaks in turn." Similarly, the objectives for a military educational program need to make explicit what types of fire-control equipment the man is expected to be able to trouble shoot, what kinds of malfunctions he is expected to be able to identify, and what repairs he should be able to make in the equipment. Before one can start writing test items, preparing proficiency checks, or devising situational test procedures, someone has got to get right down to the specific facts and skills, and be quite explicit about them. The more thoughtfully we have identified the important specifics, the more adequately we will appraise the value of our product.

The statement should be behavioral. It should say what the graduate from the training program is to be able to do. It should be in terms of acts performed—acts that are observable and potentially testable.

Evaluation of civilian educational enterprises has been concerned, at various times, and in varying proportions, with educational structures, educational processes, and educational products. Thus, evaluators of a school reading program may inquire whether there is a library corner in each classroom with a variety of books from which a child may choose for free-time reading; or they may ask whether a specially trained teacher is available to provide diagnostic and remedial work in reading. These are illustrations of what I mean by structural evaluations. Again, the evaluators might inquire whether pupils work in small groups, each reading materials suitable to their level of skill; whether each pupil is helped to find reading suitable to his special interests or to some project on which he is working. These would serve to illustrate process evaluations. Finally, the evaluators might inquire how many of the pupils can read simple material at X words per minute, or how many can answer the questions on a passage at Y level of difficulty. These would represent product evaluations—evaluations of

changes produced and abilities found in the pupils who had been exposed to the program of training.

We would all agree, I think, that the ultimate goals of any program of education are to be sought in the product domain. In the last analysis, whether a program is doing its job well or ill depends upon the changes that it produces in the persons who are exposed to it. But in civilian education especially, where the school program lasts over a dozen years and where the end results that are sought lie in part in adult life after school, evaluation of final products may not be practical. Changes relating to some of the less tangible objectives may take place too gradually to be observed; some changes may be "latent" for awhile, and appear in the behavior of the individual only at a later date; some changes may not be observable by the techniques that we have been able to develop, or may be evaluated only at such great cost of time and money that the evaluation is not practical.

It is for such reasons that we often fall back upon evaluations of structure and process—of how the school has been organized and of what goes on in it. We rely upon our philosophy of education, upon accumulated research on the learning process, or upon just plain common sense, to support the conclusion that process A should produce product B—that pupil participation in planning class activities is desirable; that writing actual letters to persons outside the school is better than writing compositions, and so forth.

But such a retreat from evaluating our educational enterprise in terms of products to evaluation in terms of processes is always risky. The assumption that the process will in fact produce the desired product, or produce more of it than some other process, may be in error. The evaluation is at best an indirect one. In military training programs one would hope that any resort to structure or process evaluation can be eliminated, or held to a bare minimum. There is a directness of relationship between training program and duty assignment that would lead us to hope that any significant outcomes of a training program can be observed as products produced—changes in the behavior of students that will exhibit themselves either in performance on examinations or proficiency checks during training, or in job proficiency shortly after training is completed. One of the satisfying things about many military programs, it often seems to the civilian evaluator pawing his way through the cotton wool of preparation for "citizenship in a democracy" and "worthy use of leisure time," is that the objectives of military training are relatively immediate, concrete, and specifiable in terms of clear-cut student behaviors.

On the other hand, we must be careful about interpreting the objectives of a military training program too narrowly in terms only of the changes that can be immediately observed in students during their training program. Objectives of a specific technical program extend beyond immediate technical knowledges and skills both in time and in scope. The dimension of time is obviously important. We are interested not merely, and not even primarily in what the student can do at the end of a training course. We are interested in what he will continue to be able to do six months, a year, six years hence. We are interested in the permanence of his learning, and in the value of what we have taught him as a foundation on which to build future learning. Thus, our evaluation must either extend to products beyond those

produced within the training period, or include inferences or judgments as to the extent to which these later goals will be achieved by our graduates—inferences which will probably rest primarily upon what they have learned during the training period, but which may rest in some measure upon how they have learned it.

The dimension of scope is also one that we must consider. In civilian school programs one hears a good deal of reference to "general education"—education that is not directed towards any specific vocational goal, but which is designed to make one a more happy, effective, and understanding member of our modern society. Military training also needs to give some attention to "general education" goals within the military context. Obviously an outsider such as I is in no position to spell these out for you in any detail, or with any authority. They include most of the objectives of basic military training—military discipline, courtesy, hygiene; physical conditioning and survival training; awareness of national and world problems, and of the Army's role in them. Gains in these areas need to be maintained and extended during a man's military career.

General education legitimately and necessarily has a smaller role in military than in civilian training. There is so much of a specifically "vocational" nature to be learned in such a short time that directly utilitarian learning must take precedence. However, the larger and more remote considerations should not be ignored.

Once we have managed to define our objectives fully, in specific behavioral terms, we then face the problem of developing procedures for appraising the extent to which these objectives have been realized. Over the years, a host of techniques, varying widely in nature, have been devised to appraise educational outcomes. I can at most call the roll, and direct your attention to one or two considerations with respect to each.

Psychology and education have at one time or another used as evaluation devices written tests, oral tests, performance tests, situational tests, projective tests, systematic and anecdotal observations, ratings by superiors, peer or buddy ratings, diary activity records, and self-report inventories. Each is a possible candidate for military evaluation programs.

The written test has long been the heart of civilian evaluation enterprises. Only gradually have schools and colleges extended the range of their appraisals to include things other than the marks that can be put on paper. In their movement away from written tests as sole evaluation devices, I believe that military schools are generally ahead of civilian ones. Of course written tests have a place in most evaluation programs. There are always some objectives of an essentially intellectual nature—objectives phrased in terms of knowledge of facts and principles, and ability to apply this knowledge—which can be appraised in part by printed tests. With ingenuity in formulating test items, as in some of the "tab tests" for trouble shooting, the range can be considerably extended. Paper-and-pencil tests are useful tools in their place, as long as we do not let them usurp the whole evaluation process, and as long as the words and symbols that we use are a tool for testing real understanding, rather than a barrier which prevents real understanding from showing itself or a camouflage behind which the glib and facile individual hides a lack of any real ability to perform.

So much of military training is directed toward skills of one sort or another that performance tests, in which the trainee is called upon actually to exhibit the skill, have an immediate appeal. These have been developed in profusion. They have, of course, presented a wide gamut of practical problems. Such tests tend in many cases to be time-consuming and costly both of equipment and examining personnel; reliability is often none too good; maintaining the security of test tasks may be a problem, especially if they are few in number. But in spite of practical difficulties, we should expect performance tests and proficiency checks to continue to occupy a central role in the evaluation of military training, and we should combine all available know-how on their refinement and improvement.

A situational test is, in a sense, an overgrown performance test. It is a test that simulates a complex job situation. I tend to use the term when the situation involves other people—others to be supervised, directed, or worked with in some way. However, this definition is somewhat arbitrary. The thing that we must remember is that many of the tasks of military as well as civilian life are group tasks, and that among the important skills for a soldier are those of cooperating in or directing a group. These appraisals are complex and far from satisfactory, but much of the progress that we have made with social and situational evaluations has come from the military. This is important work that needs to be continued.

The military has had a long, and I would judge a generally rather disillusioning experience with supervisory ratings as evaluations of proficiency. At least, if the continuous ferment and repeated change in officer efficiency rating forms is any indicator, I would judge that satisfaction has been something less than complete. But with all their limitations, we must recognize that ratings are something upon which we will always depend in part. There will always be aspects of proficiency that appear as "will do" rather than as "can do" or that emerge primarily as the effect that one person has upon others. There will always be subtle aspects of interpersonal reaction that we can appraise, if at all, only through the impression that a man makes on others.

Traditionally the "other" has been the responsible supervisor or instructor, whose responsibility it is to render a judgment of the quality of performance in his subordinates. But the factors limiting the accuracy of such evaluations—individual bias, halo effects, limited opportunity to observe, lack of a common standard of reference—have been sufficiently apparent so that military groups have pioneered the development of peer ratings—"buddy ratings" by the members of the group to which each man belongs. These are believed to have the advantages that, firstly, one gets a large number of independent evaluations of each man and, secondly, raters have an intimacy of acquaintance that a supervisor rarely has opportunity to develop. In research studies, buddy ratings have often appeared to work rather well, but I have gotten a somewhat disillusioning view of them in recent years. Each semester as we are discussing peer rating techniques in my measurement course, I invite the students in my class to comment on their experience with buddy ratings in the service, and each semester the class is entertained with lurid tales of collusion and conspiracy—of gatherings the night before rating day to decide who was in need of the "breaks" or how the ratings should be "rigged" so that they would come out the same for everyone.

I suspect the veracity of some of these tales, but they do point out certain problems that are encountered in using ratings by peers.

Observational procedures for pupil evaluation, as applied to civilian education, have been of two types. One has been relatively systematic, pre-planned observation, which has been used from time to time in research studies involving curricular innovations. Thus, the impact of an experimental unit on nutrition was evaluated in part by observing students as they came down the cafeteria line, noting whether they included green vegetables, salads and fruit in their luncheon menu, or whether they contented themselves with a coke and two desserts. The other type has been the informal, anecdotal type of observation, in which the teacher has jotted down notes recording significant items of student behavior. The role of either of these types of observation in evaluating military training programs is not immediately apparent. However, the possibility that planned observations of student behavior in natural situations may be a useful research tool for evaluating some outcomes of a curricular experiment in a service school should not be neglected.

Some of the important outcomes of education are largely internal. These include such things as interests, feelings, and attitudes. They are known directly only to the person who experiences them. Of course, these inner experiences are important to us primarily as they influence behavior—and eventually we may be able to observe the behavior. The individual applies himself to his job and tries to learn more about it, or he loafs along, just getting by. He brags about his outfit in the local bar, or he knocks it. He re-enlists, or he drops out of the service. But these actions are remote in time, often difficult to observe, and influenced by a host of situational factors. Verbal reports of interests and attitudes represent a useful, quick approximation to more basic indicators of satisfaction and morale that are potentially valuable, if they are gotten under circumstances that do not lead the trainee to distort and camouflage his real feelings.

When it comes to projective tests--those mysterious and seductive devices where by reacting to a vague picture, a splotch of ink, or the first few words of a sentence the individual is supposed to reveal his inner being—I have nothing to say. In spite of their many advocates, I have no confidence that they have anything to offer to civilian education. I have even less that they have any role in the military.

After we have assembled evidence by such a combination of the techniques that we have just been considering as seems appropriate, in order to appraise the degree to which the objectives specified in our original analysis have been achieved, we must integrate the evidence into some type of judgment. We must judge whether a change in curricula has resulted in better achievement or whether it has failed to do so, whether an individual is sufficiently competent to merit assigning him to an operational unit, whether he should receive further training, or whether he should be dropped from training as hopeless.

Combining the evidence into a final judgment involves two types of decisions. One is a decision as to the weighting of different items of evidence. The weighting may be entirely intuitive and implicit, as it is in the decision of the typical business man reaching a decision on whether to hire an applicant for the job of sales manager or secretary. A final

impression grows, depending in unspecified amounts upon the applicant's previous work history, present personableness, recommendations, and, just possibly, test scores. Or the weighting may be entirely mechanical, as it tends to be in most military training schools of which I have had any knowledge. But the decision on weighting is always there, implicit or explicit. Even the attempt to avoid a decision by weighting everything equally—what I call the "principle of equality of ignorance"—is itself a decision.

How we shall weight different components of a total evaluation is basically a rational decision, based upon the same type of analysis that defined the objectives for us in the first place. That is, an analysis of the goals of instruction should provide us not merely a list of the knowledges and skills that represent the objectives of a program of instruction, but also a specification of the importance of each. These judgments of importance are the basis for our weights. However, in the actual combining of test scores, class marks and ratings of practical or laboratory work, there are several statistical artifacts and booby traps. These are fairly technical, and I do not propose to go into them here. I will merely point out that the effective weight of a variable and the purported or nominal weight may be very different. The effective weight depends to a very large extent upon the spread or variability of a particular set of scores. Thus, if one test with a range of scores from 50 to 90 is simply added to ratings of practical work with a range only from 80 to 90, the test will have roughly four times the effective weight of the ratings.

The second type of decision in the use of evaluation results has to do with the minimum qualifying score to graduate from training or to enter upon a job. The thing that we need to realize here is that this is primarily a matter of supply and demand. We rarely, if ever, operate in terms of absolutes. Examinations can be made harder or easier. Ratings are quite sensitive to admonitions from higher headquarters to "get tough" or "go easy." I still remember the sensitivity of the pilot washout rate in World War II to speeches by the Commanding General. Thus, in planning examinations, setting passing scores, and manipulating decisions as to how many men shall be considered to have completed a program successfully, one works continually towards a compromise between the demands for the highest possible level of competence within a job and the demand for an adequate supply of bodies. In an economy of scarcity in which personnel are in short supply for many high-priority specialties, one can hardly afford to fail many of the men assigned to a given school, so that the economics of the situation will probably usually dictate that attrition be held to a low figure.

In the present world of cold war, and continuous partial mobilization of our manpower, the military establishment probably represents the largest program of adult education in the country. It is vital to us all that this program be an efficient one. It will be, if we are precise and thoughtful in defining our training objectives, ingenious in devising training methods, and systematic and conscientious in evaluating the outcomes from that training.

CHAIRMAN VALLANCE: Thank you very much, Dr. Thorndike. We will now go into our various Discussion Groups.

(The Conference adjourned for Group Discussions.)

(The Conference reconvened following Group Discussions.)

CHAIRMAN VALLANCE: Since I have no administrative announcements, I will turn the meeting over to the summary activities and call for the report from Group 1, whose topic was "Performance Tests: Individual Skills." Dr. Marks.

DR. MARKS: I think no better compliment could be paid to Dr. Thorndike than to say that at least eight to ten times during the discussion I was able to preface my answer by saying, "As Dr. Thorndike said. . . ," and then give the answer.

We discussed the general nature of performance tests, the problems in putting them together and in validating them, without too much controversy, but there were a few points that did come out that were controversial.

One had to do with the extent to which one might combine in the same testing vehicle performance aspects and verbal aspects, one point of view being that it was very wasteful to spend any of the performance-testing time on having the examinees talk and answer questions; and the other, there might be circumstances in which this would be an efficient method. We did not come to a group decision.

Another point came up in terms of performance tests for fairly abstract activities such as leadership functions: whether the appropriate test was not the total effort of the group rather than a test of what the leader himself does, that is, a test of the way in which the leader behaves. I think we came to agree that certainly the ultimate criterion of leadership was what the group did, but very frequently in performance testing of leadership one might have to pay attention only to the behavior of a man who is being tested as a leader.

A third interesting point, and I am reporting it because it was interesting and not controversial, had to do with performance testing—let me put it in a setting—say in the firing of a ballistics missile. A great number of check-out procedures have to be gone through by relatively untrained men. This may be on the maintenance level where there are some very complicated maintenance operations to be performed. Suppose that the examinee does 90 per cent of them correctly or 99 per cent of them correctly but as a result of the one thing he did not do correctly or did not do at all, the missile does not fire. What way would you score this performance test?

I think we came to the agreement that in certain situations, go or no go of the entire performance should determine the results rather than—on a partial credit basis—all of the right things that were done in getting to the point where the wrong thing was done.

One final point was the tough decision that has to be made when one has built a performance test and is now striving to prove that it should be adopted, that it is a good test. One has to rely on some external measures, such as on-the-job ratings. What happens when the two do not agree? There is the problem of deciding in some instances if the test is testing exactly what you want it to test, and if the on-the-job situation involves some things other than what has to be tested, one might accept the test results as the final measure, even though they do not relate as perfectly as you might want them to to on-the-job performance.

I think it was a fairly interesting session with a fair amount of discussion, but, as you see, we did not come to any real conclusions.

CHAIRMAN VALLANCE: Would anyone like to ask any other questions, particularly non-Group 1 people who were not witnesses to this discussion? If not, we will move on to Group 2, who discussed "Performance Tests: Unit Proficiency." I understand Dr. Jones has the summary material on that.

Dr. Jones.

DR. JONES: Gentlemen, I have a rather unenviable task of trying to summarize this. We had an extremely lively session. Much interest was evoked and although we divided somewhat into two camps, we got together at the end, at least partially.

The subject was unit testing, and it was pointed out at the beginning of this session that the problem of unit testing has been approached two different ways which disagree with each other in some cases. You can test the individuals that you have in a unit and, on finding their proficiency way up there, you can put them together in the field on a unit problem and get a different result. Contrariwise, it was pointed out, you can take a unit that performs very well on a unit test, gets a tremendous score, but test the individuals and you find that they know nothing. That is, they do not know what is specified that they should know in their jobs to the degree that is specified.

That brought up the question: What is a unit test really oriented to test? The statement came forward, with strong support, that a unit test tests the leader.

Immediately, when agreement was reached on this point, someone brought up the troublesome suggestion that you could test a leader much more cheaply than by running a battalion over the landscape and firing up a lot of ammunition—with the involvement of the countless personnel that it takes to support such an operation. So if it is a test of the leader, the question was raised: Is there not a more economical way to arrive at the same result?

Well, we did not get far on that point before the point was raised that if it is a leadership test and if we want to run it this way is our input to it adequate? Do we call on the leader to do the sort of thing that we know he has to do in combat? Intelligence strongly disagreed that we do. In combat, the leader has to find out what the situation is by aggressive use of his resources. He has to evaluate it and then fight. When we give him everything cut and dried, and we have found he may be performing in a way we can rate reasonably, is this performance really related to what we are interested in?

Then the point was raised as to whether or not all of these things are true; if so, the one thing we have got to do, whatever we agree on, is to be very, very careful and specific as to the mission. That is, what do we expect the unit to accomplish? The mission must be translated into the behaviors and interbehaviors that will support it—those of leaders, troops, or leader and troops—in order to get a good measurement.

Now, the question was raised whether a test is just a test or not. It is a pretty expensive item. There are a lot of people involved in it. Should it not also be a training exercise? Should not everyone learn something from it?

Then the question of testing and the influence of tests on efficiency reports, and all that nasty stuff, got into the discussion. If a test is just an

evaluation on which a man's efficiency rating will rise or fall, we know what the attitude will be toward the test. If a person or a group of persons involved feel that they have a deficiency, it will be covered one way or another, human nature being the way it is; it will be covered in order to provide a good look.

If on the other hand, the emphasis of the officers so testing were such as to enable us to find out not only where we are but what we need to get where we want to go, perhaps results would be better.

Now, at this point we came back to the main argument, what should a unit test test anyway?

It was suggested that there are two components in combat. There is a command control component. Generally you find that is getting the right men, the right equipment, and so forth, to the right place to do the right job at the right time. There is one other element of performance of a unit in combat that might be in the test, and that is the performance of the men themselves, the minutiae of combat. If either one of these elements happens to be zero, the whole complex is zero. If you put them in the right place with the proper stuff and the proper support and they fall on their face, well, obviously nothing happens. If you put them in the wrong place with the wrong equipment and the wrong support, no matter how good they are, the result is not too encouraging. So should not both of these be in a good unit test?

Hence we came to the end of our session with this much agreement at least, that serious study should be given by all training people, both research and otherwise, to try to determine in each case just how much, what portion, what stress of these elements it is important to have in a given unit test; and to ensure not only that stress is actually brought to bear in the situation, but that the situation be so set up that evaluation, in the sense of a score, be not the only objective.

Now, I feel that this is about as near as I can come to summarizing where we stood at the end of the session. I am not sure that I have completely done it.

I would like to ask Colonel Hunter and Dr. Carstater if they would like to add a few remarks to what I have said.

Colonel Hunter?

COL. HUNTER: No.

DR. JONES: Dr. Carstater?

DR. CARSTATER: Dr. Jones, I want to give you an awfully good pat on the back. You got more sense out of that meeting than I could have. I think the problem that we encounter on this is largely one of purpose for which the evaluation or measurement is intended. The problem we run into, then, is how different should the measures be or what should the components chosen for measurement be to serve those purposes?

This applies not only to how many different measures, the scope of activity, behavior to be measured in terms of breadth, but also the depth, the extent to which minutiae should be brought into the pattern.

If your only purpose is one of unit evaluation in terms of rating, you have a different depth and perhaps a different scope from what is required if your purpose is to realign the training program in general, or if your purpose is to use your measurement as a basis for corrective instruction for this particular group.

Now, it is these differences of utilization which seem to me at least to be the important thing to be considered in the design of your measuring instruments, and we dare not talk about measurement as measurement because when we do so, we are avoiding the very requirement that the military has imposed upon us. It is not measurement for a measurement; it is measurement that will enable me to make decisions.

DR. JONES: I think he has done an excellent job, much better than I did, of summarizing the crux of the whole issue. Is a test a defensive instrument to prove legally that you have gone through the motions and you have a notation on paper? Or is it to teach you and everyone else involved what you need to do?

Dr. Bornstein, would you care to add anything to this before we relinquish the podium?

DR. BORNSTEIN: I have only one point. It is perfectly true the purposes determine the measurement tool; I agree quite fully with the previous speaker on that point. However, these tools have limitations and these limitations should always be kept in mind.

It is quite often impossible to fulfill a purpose with the measurement tool. It may be, for example, impossible to develop a test to measure the efficiency of a unit or components and all of the elements we have spoken of, at any reasonable cost. So even if this is your purpose, you still have to consider the limitation of the tool. If it cannot fulfill this purpose, then, you do not use the tool; or, you use it with a proper appreciation of its limitations.

DR. JONES: Thank you. Then perhaps we need to explore further the capabilities and limitations in certain cases once a goal is determined.

Dr. McFann, where are you? Is there anything you want to say?

DR. McFANN: No.

DR. JONES: I think that does it, gentlemen.

A MEMBER: I would like to add one thing if I might. When you hear me, you will realize I am from the United States Army Intelligence School and maybe I am going to get down into a detail that is below the high-level plane we have tried to maintain here, but I would like to throw out for the consideration of everyone involved in Army testing, measuring of units, and so forth, the thought that primarily we are trying to determine whether or not we in the Army are combat-ready. That is the end result of everything we are trying to do. Do the tests that we now have determine whether or not we are combat-ready? Particularly in one respect, do we not really start our tests in the middle rather than at the beginning? In other words, do we not hand the intelligence to the people we are testing on a platter rather than have them develop it? Do we not give a battalion commander his enemy situation, and until he goes into combat, never know whether or not that battalion commander can find that enemy, determine who it is, fix the enemy, before he employs his unit?

DR. JONES: This is a challenge to the validity of certain tests, certainly; it is a good challenge. The other gentleman from Intelligence felt very strongly about this, too. I am sorry I have forgotten his name.

A MEMBER: I merely stand back of my executive. There is no question about that; we are here to fight for it and see that it gets into all training.

DR. JONES: Thank you, sir.

This should give you food for thought anyway. It certainly did all of us.

CHAIRMAN VALLANCE: Thanks, Frank.

I wonder if I could ask Dr. Carstater for a brief commentary, if this is not too extensive a point, on the Navy's satisfaction with the operational readiness inspection as a measure of the proficiency or readiness of a ship to do its job?

DR. CARSTATER: Oh, I am not too expert on that. Maybe you can do a better job of it yourself than I can, Ted.

I know that looking at them from the standpoint of a test evaluator—after all, you have to evaluate your instruments—they suffer from two things that Bob pointed out earlier this morning: One, the question of just what needs to be looked at in an operational readiness inspection: are the things that we are making our record of the things that count in readiness? Of course aside from that how much is gun deck and how much is fact? But we will skip that. The other is, having this information, how do we amalgamate it? How do we integrate it? How do we combine it into a meaningful statement or score that can be used?

We get ratings on operational readiness. We can take these ships into exercises and the usual excuse is, "Well, they took away 30 per cent of my personnel right afterward, so I didn't have the same crew any more. Besides, such-and-such broke down."

Even your ships that have good ORI's will go into exercise and won't make out so well.

CHAIRMAN VALLANCE: Thanks. I think we had better move on to the next summary, Group 3.

Dr. Brown.

DR. BROWN: The topic of discussion for Group 3 was the "Construction and Analysis of Objective and Essay Tests." Our discussion leader was Dr. Thorndike.

We first concerned ourselves with essay tests. It turns out that probably very few of the participants are making any appreciable or extensive use of essay tests in their various schools. Those few who do use them feel kind of unhappy about it. They feel that they lack confidence in their ability to discriminate or rank men on the basis of essay test scores and they feel unable to defend small differences between the ranks which various men achieve.

Some other participant pointed out that the reliability and validity of such essay-type tests can be appreciably improved if rating scales are used for the grading of essay answers and if these rating scales have fairly concrete, specific anchoring points in the criteria; and if, furthermore, each essay answer, each paper, is rated by several raters and an average obtained.

The discussion soon turned to a related matter directed at CONARC's directive that in all officer courses, the officers be rated in terms of their ability to express themselves verbally. That, of course, comes quite close to essay tests.

The fact that each school develops its own system for arriving at such ratings on self-expression creates the problem or question, is there a comparability among the various schools in the ratings that they give?

There seems to be a feeling that more guidance was needed from CONARC about this directive. What was its purpose or intent?

A representative from CONARC, who was present, indicated that he thought CONARC people who put out such directives would be very glad to hear inquiries about the intent and purpose of it. It was his feeling that the purpose was to enable appropriate assignment of officers in terms of their verbal skills.

The procedures for measuring efficiency will determine to a considerable extent and will have an appreciable influence upon the actual content of a course, the teaching methods, et cetera. At this point, we were turning to objective tests as a topic of discussion.

If objective tests are used exclusively, it is quite possible that instruction will tend to gradually drift into the mold whereby certain unrelated facts are emphasized and integrated skills are not emphasized as much.

This problem can be to some extent avoided by the construction of good objective items by highly skilled item writers. Some objective test items will require information which the student can develop only by integrating knowledge he already possesses.

Dr. Thorndike raised the question, what are the difficulties that exist with objective tests?

The main problem which seemed to be experienced by most of the participants was that written tests never tell you exactly how a man will perform within an actual work situation. You are measuring his knowledge to some extent, but what he knows is not necessarily an indication of what he will do in a practical situation.

The consensus seemed to be that that was necessarily true; that written tests, either essay or objective, can only be a part of the total appraising process and cannot do the entire job when your effort is to rank men in terms of how they will do in an overt behaving type situation.

Another problem which was mentioned was that with so many technical courses in electronics fields and other technical fields, that there is a vocabulary problem that exists. Different terms are used in different areas. Local terminology is built up.

Someone expressed a view that a technical dictionary should be developed fairly soon before a variety of uses became fixated and less amenable to change.

Someone raised the question of whether it is preferable in an Army school to have the tests developed, built by some central testing agency; or should each instructor build his own.

Dr. Thorndike suggested that a system intermediate between these two extremes would be preferable, and this feeling seemed to be well received by most of those present; that is, the intermediate system would be one wherein the test experts and the subject matter experts work together, rather closely, and each contributes his own special knowledge and skills to the problem of developing the tests that are to be used.

Many participants indicated that they do use such a system.

The topic of item analysis came up for brief discussion. Someone asked, should we really make a great effort to have all objective test items at the 50 per cent difficulty level. That is an old textbook criterion that has been used for many years. Dr. Thorndike cautioned against over-reliance upon this.

Item analysis does help you identify a real lemon in a barrel of items, but it cannot tell you how important an item is.

Perhaps a more realistic objective would be to select items which have difficulties ranging around 50 per cent, by some 20, or 30 percentage points.

A final question that was raised was, what should be the role of clinical impression or clinical judgment in evaluating students? The opinion, the impression of the instructor or supervising personnel, how much should that be a factor? Is there too much reliance on numbers and not enough on the person who is acquainted with the study habits and classroom activities of the student?

It was suggested by Dr. Thorndike that clinical judgment may in many cases have an important role. However, it should be obtained and used as one component in the total appraisal system, giving it whatever weight it seems to require in the judgment of the personnel at the school.

Recommendations of the group: One recommendation was made by a CONARC representative, and since there was no dissent, I assume that it reflects the feeling of the group: that whenever educational advisors are unhappy about certain directives from CONARC concerning course objectives, and so forth, or are unclear about the real intent of such directives, they should take the initiative in seeking clarification from CONARC as to what is the intent. He said that it is the general intention of CONARC to allow the educational advisors considerable leeway in devising means of achieving the purpose and intent of the directives.

A MEMBER: Would you mind making that "school commandants" rather than "educational advisors"?

DR. BROWN: School commandants rather than educational advisors. That is, school commandants should take the initiative in seeking clarification of CONARC directives.

I think another recommendation might be made. We did not take a vote on it, but it was my impression that most of the people agreed that the best way for developing tests in a school situation is to have the test experts and the instructors, the subject matter experts, work closely and call upon each other when they need to, rather than having a group of people develop a test entirely on their own.

Dr. Thorndike, have I omitted something? Would you like to add anything to what I have said? A lot of ground was covered and I am not sure I covered it all.

DR. THORNDIKE: I do not know. I was following along as you went.

I think the pattern of the resource expert and the subject matter expert interacting and working jointly, the possibility of workshops and study groups on item writing, was one that was apparently rather generally practiced and conceived to be very successful where it was; and perhaps our recommendation was that the schools which did not already have this pattern, such as there were, might seriously consider it as desirable for improving their paper-and-pencil test-making procedures.

I would like to add one item, too, on this matter of the relationship of statistics to test construction. My general reaction is that statistics are a collateral and secondary rather than a primary aspect of test instruction.

Just one other item, one that is rather specific and perhaps not too important, I would like to have you shoot at about 70 per cent average difficulty rather than 50 per cent on objective tests with multiple-choice answers.

I was impressed with the number of the groups that were actively interested, I thought, in the problems of essay examining. My impression after this morning's session was that this looms rather larger in the thinking of you gentlemen than I anticipated that it would.

It seems to me there are real opportunities and needs of problems for improving the effectiveness of other than objective paper-and-pencil tests, particularly in the officer training schools.

DR. BROWN: Would anyone else like to make a comment or raise a question?

DR. CARSTATER: I should not be talking so much about this, but I have lived with it for a number of years.

I wonder if I could get Dr. Thorndike's agreement on one proposition; that is, in all of this we are concerned with increasing the objectivity of our measurement regardless of whether the thing masquerades as an objective test, imposed test, or whatever it may be. Also in this regard, increasing the objectivity of our measurement may involve finding ways of increasing reliability and validity of some of these things which you referred to as clinical judgments. If we are going to talk of clinical judgments, if we are going to talk of clinical use, then it seems to me that we have to clinically interpret test results, that these should not be separate from each other but the clinical evaluation supplements and uses test information; it is not just another technique.

Dr. Thorndike?

DR. THORNDIKE: Well, this is the point that we sort of hacked about a little bit.

My reaction is that there are two aspects of this clinical thing. One is that in some respects you may have impressions which are a datum which you want to put into the pot, which are unanalyzed, unstandardized impressions of a person who has reacted to the student, to the evaluatee, the person being evaluated. As a datum, this may be valuable and may stand on its own merit. The other is the notion, all right, here are a whole lot of data, test scores, grades from practical work, and so forth, which are available. Should you arrive at a final appraisal clinically or actuarially? I am afraid on that one, I am on the actuary side of the fence.

DR. CARSTATER: Bob, on this particular thing, is it not possible that where you have actuarial information that the clinician still uses—that is, here we are working with people who are in a working situation, they are trying to carry on a program of instruction and they are necessarily going to make clinical decisions as to what they are going to do.

Now, I come back to the first one. Throughout we need to increase the objectivity of our measurement, the objectivity of our decision, and we should use to the extent available any objective material that we have. There are two things that we still need to do: One is to work on impression, where the thing is needed but we do not have the objective evidence, we have only the circumstantial as interpreted by the witness; and the other is that we have to know that that is only circumstantial and we come smack up

against the problem which you raised earlier in your opening discussion of are you going to weight the elements that you have in the problem.

DR. THORNDIKE: Well, I am not quite sure where we are battling.

DR. CARSTATER: I hope we are not. I am trying to reach clarification, Bob.

DR. THORNDIKE: In our talk upstairs, we began talking about this matter of subjectivity versus objectivity. I think we agreed that in the defining of the objectives of your teaching, this is a rational analysis rather than an empirical objective type of thing; that is, it is a combination of best judgment.

In deciding what tests or what test items represent these objectives which you have defined, this again is a rationale rather than an empirical matter in large part.

In developing devices to appraise, having once made those judgments, then the mechanics of grinding this test instrument through the mill we would like to make as objective as possible, as little subject to individual interpretation, bias and prejudice, inadvertence, lapse of attention, and so forth. The final outcome is some type of judgment or decision or plan for action with respect to the individual, the curriculum, the new training program, and so forth. This again is a rationale judgment rather than a judgment which comes out of or something that comes out of any statistical mill.

Are we together on those sort of points?

DR. CARSTATER: I think we are on all fours with possibly one shadow; that is, clear back we get fouled up on the semantic differentiation between objectives and objectivity.

Yes, the defining of your objectives for a course objectives of measurement may not be the same, but—

DR. THORNDIKE: I am talking about the goals, the outcomes you are trying to achieve as a result of the course.

DR. CARSTATER: Yes. So again this satisfies yourself in the purpose for which you are making your appraisal or evaluation. Whatever these may be, we still want our processes to maximize the substantiality, the verifiability, the objectivity in a legalistic evidence sense, rather than in the statistical as-agreed-upon-by-observers sense. Well, not rather than, but in addition to.

CHAIRMAN VALLANCE: I think we have ground to a halt on this discussion. I will thank the participants again and turn to Group 4 for the final review and report before lunch.

Mr. Porter.

MR. PORTER: How much time do I have?

CHAIRMAN VALLANCE: Take five or ten, whatever you need.

MR. PORTER: Five? That is your best offer.

If you will turn to page 10. We followed Dr. Thorndike's advice and set very specific objectives. Our objectives were to answer these ten questions which you find on page 10. This is the way our answers ran:

One. What are the purposes of grades in the various Army service schools?

We came up with a textbook answer: the first word mentioned was "motivation" or "incentive for learning," and from there we went to

measurement of student achievement, the evaluation of the training program, the evaluation of instruction. Then we got down to facts and said that tests are used as a basis for marks and as a basis for selection of personnel.

Two. What are the general characteristics of the grading systems now in use?

The one word, the first word which came out, was diversity.

We found that we all used written examinations in various forms. We found we all used performance tests in various forms, and that we all made some use of observation techniques. But when we came to collating those, it was every man for himself.

Characteristics I think are best characterized by one word, "diversity."

Three. List criteria which can be used to determine the effectiveness of a grading system.

That was very quickly answered in our group—Does it meet the needs of the school?—and they decided not to discuss it any further.

Four. Should there be a standardized grading system for use in all service schools?

The answer—not necessarily. The needs are different. To bring the various systems we now use into a standardized system, and by standardized we meant, a oneness, would almost overwhelm us.

Five. What guidance pertaining to grading systems should CONARC give to service schools?

The guidance should be general. We seem to have a feeling that perhaps we could use some guidance as to what words mean. We found some difficulty when we talked about grades, and marks, and scores, and percentage, and percentile; maybe we need a field manual. Certainly we need a meeting of the minds there.

We reviewed what CONARC, Ground Forces and Field Forces have done in the past and finally decided our present system, which says "The commandant of the school must set up a grading system to meet his own requirements," perhaps is best.

Number six, which was very interesting, reads: Is there an overemphasis placed upon grades in the Army school system?

We seemed to detect that there is a feeling, which seems to be growing, that perhaps in our branch schools, the advanced courses have placed an overemphasis upon grades. But in discussing this, it was finally concluded that perhaps that was in the mind of the student and that there was no better way to give grades and to try to measure a man's achievement than the present system and that we do not overemphasize grades. We do not admit to it. In the minds of the students, yes; in the mind of the school administrator, no. So the answer is yes and no.

How should critical scores be established?

Now, we approached that question in this way: How are they now established? What is good and bad about the way we do it? And how should they be done? How should they be established?

Critical scores are established in a number of ways in our various schools; I think you recognize that. Some of our schools set across the board 70 per cent as the critical score; below that you fail. Others adjust critical scores based upon experience factors, based upon distribution

scores, based upon the judgment of the instructor. Others use a standard scoring system where 100 is the mean.

We tried to generalize on that particular question, how should they be established, and I think the group will bear me out that we felt the critical score should not be arbitrarily set by statistical means. We felt that the judgment of the instructor should enter into the establishment of critical scores. We felt that the experience factors gained by administering the tests to a number of groups should be considered. We came up, I think, with the general statement that one of the most important things or one of the very important things in the establishment of the passing score was the combined judgment of the instructor and the school administrator.

How should examination results and class standings be reported to students?

Here there are also a variety of means used. At the present time, they are reported with the letter grades which have different meanings to different schools. "A," for example, means above 90 per cent, we will say, in one school; in another school, it means in the upper 20 per cent of the group.

In some schools they list the examination results on the board, by code number in some cases and by students' names in others. Some schools use percentage scores and report their test results in that manner.

We did agree upon this, that there is a value in reporting examination results. There is a value in telling the student his standing. And certainly at the end, there is a value in telling him how well he has done.

We gave very little time to the ninth question and it will take me a very short time to sum it up: How are the members of the faculty and staff trained in the use of the grading system? In both cases that I heard—this was handled as we passed out of the room and those that I heard said this (they can speak for themselves if I do not represent them)—they felt that in their instructor training courses, in their orientation of new personnel, there should be a very careful explanation of just what the grading system is in the school and how it operates. In other words, a man should be thoroughly oriented. They think perhaps that should go into the instruction courses.

I tried my best to be brief here and I think I finished under the wire. The bell just caught me.

I would like to say this, that it was a most pleasant experience to have been group leader of such an excellent group. I hope I have summed up what they thought. And if I have not, they surely will not shoot me down after that complimentary statement.

FOURTH GENERAL SESSION

Wednesday, 29 January 1958

Instructor Training and Evaluation

CHAIRMAN VALLANCE: This afternoon our attention turns to the man in the middle of the instructional and teaching process. We have talked about programs and programming. We have talked about evaluating the outcomes and how to determine if we are getting what we want for the price that we are willing to pay, and we will turn now to the question: How can we train the people who are going to have to communicate the information and skills that will be evaluated within the programs we have set up?

The instructor is the man on the end of the log that we are going to be concerned with this afternoon. As the leader today, as the lead-off speaker, we have with us a man who probably has had longer and closer contact with the Army's schooling and school systems than 95 per cent or more of the officer corps of the Army.

General Newton (when I knew him he was Colonel Newton) is now living around the environs here. But we used to have quite a bit of business back and forth with his office at Fort Knox when he was Director of Instruction at the Armored School.

I have heard him speak on a number of occasions, on a number of topics. I am glad that we were able to elicit his interest in coming to the Conference to talk to us today about the general setting of the instructor training and evaluation problem.

General Newton.

GENERAL NEWTON: Little did I think gentlemen, when I retired last year, and after traveling in Europe for a year, decided to settle in Washington, that I was going to be here today talking to such a distinguished group. But I couldn't overlook the opportunity because, as some of you know, I do enjoy talking—I don't know why it is—I presume it is an attribute which we find necessary to those who have been closely identified with the Army school system.

My subject is the "Role of The Instructor in the Military School System." I can deal with the role in a very short and concise fashion—the instructor, in my opinion, is the school. The end product of all the very

interesting discussions we have enjoyed here the past few days; the planning which we might do; the directives from all levels of command; the vast administrative detail; writing of units of instruction; the "murder boards" and rehearsals; the high degree of perfection always associated with these progressive steps in preparing a unit of instruction, rests on the shoulders of the instructor. When he takes the platform, he makes or breaks the unit and with it the school!

The above statement, I believe, places the role of the instructor in the proper perspective. The all important problem really involved is how do we obtain this rather peculiar individual who possesses all the characteristics so necessary for this very vital task? Familiar to all of us is the part played by the Officer Assignment Division of the Office of the Adjutant General. They have the responsibility for the selecting and assigning of officers to the staff and faculty of the various schools. I feel that, in many instances, we are quick to criticize this assignment procedure, however, it is the only, what I might style legitimate source, available to us. Unfortunately, the officer assignment problems are extremely complex and the chiefs of the various arms do not always control the destiny of the officers within their branch. There are always the higher levels of command which are constantly requesting officers by name and through a series of personal contacts, able to obtain many of our most capable officers, predicated, of course, upon the echelon requesting the particular individual. As I analyze the assignment of officers I am of the opinion that the school system "enjoys" about a fifth priority. I have never agreed with this concept and have always felt that our schools should have the first priority inasmuch as they have the responsibility, to a very great degree, in preparing officers to assume duties in the preceding four priorities. I will say, in all frankness, that I have never been able to maintain this position against those officers who control the selection processes. All I can recommend, in this area, is that the Commandants and the Assistant Commandants establish a close working relationship with their responsible branches of the Assignment Division in an effort to obtain the best possible results in the selection of officers. I can quote many instances where officers assigned to the school did not possess any of the basic requirements of a potential instructor although their records so indicated. This is one of the obvious faults of our selection system. It is utterly impossible for the various sections of the Officer Assignment Division to know all the officers of a branch and be sufficiently familiar with their personal characteristics and idiosyncrasies as to evaluate their potential as instructors.

A very fine source of instructors can be found in the Associated and Advanced Classes of your own schools. There you have these officers from four to nine months as students—your instructors have close daily contact with these students and are in a pre-eminent position to evaluate their professional competence as well as other characteristics which are vital to the successful instructor. In many instances, I have been able to submit a list of names of student officers who would be valuable assets to the staff and faculty. Here, of course, you again face the problem of priorities. I have always been successful, however, in obtaining a few fine instructors through this method.

We also have another approach to the problem, namely, the staff and faculty of the school itself. I found in several instances, that members of the staff and faculty had close friends in the service and, through personal correspondence, had information as to when they were returning from overseas and whether or not they would enjoy a school assignment. I constantly accumulated the names of officers from this source and through personal contact with the assignment agency was reasonably successful in obtaining their assignment to the school. I have always found a sympathetic approach to this rather informal method of operation on the part of the Assignment Division and, in countless instances, it produced a type of officer we could use to the maximum.

The school Commandants or Assistant Commandants should keep very close touch with the Division Commanders throughout the world. At the Armor School we made it a definite practice to maintain constant contact with our Divisions through a flow of correspondence in which we provided them with the latest school publications on doctrine and techniques and in turn received countless studies, reports, and experiences which aided us materially in our teaching effort. In many instances, we would receive information on outstanding officers from the Divisions who were returning to the United States, and information indicating their suitability to fill the vacancies on the school staff.

We are all familiar with the requirements of a good instructor. I would, however, like to emphasize just a few points which I feel are essential attributes of such vital importance they should be high on our "check lists." Primarily, I look for depth of knowledge of subject matter. The instructor must be so thoroughly grounded that when he takes the platform he does so with an absolute sense of self-confidence and professional security. With this background he can handle any phase of his subject without fear. With this background he is free to devote more of his thinking, while on the platform, to his technique of presentation and various methods of drawing upon his vast reservoir of fundamental knowledge. With this sense of security, his presentation becomes more meaningful and conveys to his students a sense of professional competence, which otherwise, would be utterly impossible.

An instructor must have initiative. Gentlemen, give me officers with initiative. Our instructors must have initiative—the ability to project themselves months ahead in their planning. Sometimes I feel that the very system of the Army stifles initiative. Many of you know that too much initiative is at times dangerous. An instructor must constantly seek out new avenues opening up new doctrine. The officer with initiative possesses this type of an approach to his ever current problem of teaching. I also look for a high degree of enthusiasm. Enthusiasm is contagious, and when an instructor possesses this approach the impact of his teaching upon the class is very much in evidence. After all an instructor is selling—he is selling a particular commodity. An officer who possesses initiative and enthusiasm is bound to be a good salesman—he will be successful selling Coca Cola, Life Insurance or Cadillacs. Why? Becuase he possesses those two priceless characteristics of initiative and enthusiasm which are equally essential for success in the military profession or any civilian activity. I am interested in a comment which I will quote from a recent publication relative to the problems

of teachers in our civilian schools. "The able student can tell the difference between a teacher who knows and lives his subject and one who doesn't. The first passes on his fire; the second doesn't have any fire to pass on." When an instructor leaves the class he should ask himself the question "what did you leave with the class." I do not mean simply instructional material or doctrine. He must leave a part of himself, the impact of his own personality! Unless that condition is met, he is not really teaching.

Now let us analyze some of the instructors we have had during our own life time. Go back with me over a span of years—reflect for a moment on your days as a student in high school, college, and the Service Schools. How many of your instructors, during those years, can you recall to your mind—men who really affected your thinking and contributed to the building of your own character—those men who really had a definite impact upon the shaping of your lives. To me, I can remember four—as if it were yesterday. I shall never forget my first debating coach in high school—two instructors in college and one in the Army. Why did these men stand out so much, as men who affected my thinking? First, because they were absolute masters of their subjects. They lived their teaching and they knew every phase of their subject matter thoroughly. Second, they were able speakers. They could sell their concept; they could hold the class right in the palm of their hand—you looked forward to the time when that particular instructor was on your schedule. Third, they believed what they taught—they were not intellectual hypocrites or sounding brass and tinkling cymbals, and, lastly, they had a deep sense of personal responsibility to the student—they always had time for the student and his problems; the element of personal obligation as a teacher of men was paramount in their minds. Very few men fill this exacting pattern and that is why, gentlemen, you can recall quickly those who have had these essential characteristics.

That much for the "Role of The Instructor."

Further consideration of this very vital problem will now be in the hands of the discussion group. It has been a pleasure indeed for me to have had the opportunity of presenting these few thoughts for your quiet reflection.

CHAIRMAN VALLANCE: I thank you for an informative and entertaining half hour. With this we will break off, and move into our respective discussion groups.

(The Conference adjourned for Group Discussions.)

(The Conference reconvened after Group Discussions.)

CHAIRMAN VALLANCE: I am happy to announce that I have no administrative announcements, so that we can get right down to business and call for the report, first, from Group 1, "What is a Good Instructor?"

General Newton has a few remarks on that.

GENERAL NEWTON: After having a very spirited and, at times, animated discussion of the over-all problem, I feel that I can best report our findings to the conference as follows:

The instructor should have a depth of knowledge, and with that an organizational concept, coupled with a high degree of mental flexibility.

It was pointed out by one of the conferees that, in the question of the depth of knowledge expected of the instructor, the new weapons system posed many problems—and in that area we do not have the depth of knowledge that we would expect in other areas.

A record of previous teaching or speaking ability is highly desirable on the part of the prospective instructor. In this connection, all Army officers have taught in varying degrees, and this capacity can be further developed through training. We wish to point out, however, that there is a considerable difference between the normal training conducted by an officer and formal platform presentation as used in our service schools.

It is highly essential that the instructor be of even temper and have the characteristics of patience, forbearance, coupled with a definite humor. We use, in this connection, the term "presence," which is a little hard to define but an element, the lack of which is always obvious.

An instructor should have a high degree of enthusiasm and initiative. These characteristics are obviously essential inasmuch as so much of our teaching becomes a problem of "selling" ideas.

The question of personal appearance, physical bearing, voice, and personality are all essential attributes of a good instructor.

In our training of instructors, it would be most unfortunate if the program should in any way attempt to change the personality of an officer. Teaching has certain fundamental concepts of techniques in the area of presentation. The training should capitalize upon the personality of the instructor to strengthen his approach to the problem of teaching, thus creating a faculty capable of properly presenting doctrine while each instructor preserves his own personality, method of approach, and freedom of action within the over-all fundamental concepts of sound teaching techniques.

Several of the conferees were of the opinion that the instructor should have expressed a desire for a school assignment and be vitally interested in teaching. We recognize the soundness of this concept; however, it does not necessarily follow that an officer who does not desire such an assignment, would not qualify as a satisfactory instructor after proper training. I cannot understand why any officer should object to an assignment to the staff and faculty of a service school. His experiences as an instructor would qualify him to think on his feet and develop a teaching and speaking capability which would always be an extremely valuable asset.

The Army has an extensive postgraduate training program for officers covering some 15 different areas of interest; however, very few, if any, of our officers receive postgraduate work in the field of education. A determined effort should be made towards selecting specially qualified personnel for advanced training in the field of school administration and pedagogy—these officers should then be "earmarked" for future assignments as Directors of Instruction and Assistant Commandants as they develop in their military careers. I would estimate that we have some 200,000 people annually in our school system, including staff, faculty, and students. This is a very costly operation and can be improved considerably if we give more thought to advanced professional training to a selected group of officers destined to direct our effort in this very vital and important area.

I might go back to my opening statement I made earlier this afternoon—the role of the instructor can be stated in very short and concise terms—he is the school.

CHAIRMAN VALLANCE: Thanks again.

Are there any questions?

Very well, let us give Group 2 an opportunity to summarize what happened in their discussion of the "Problems of Motivating the Instructor."

Major Groves.

MAJOR GROVES: Group 2 was a pretty shifty bunch this afternoon.

We have nothing to offer you but vague generalities, I am afraid, and this was probably General Newton's fault. He is as much to blame as anybody for that, with his statement: "If all instructors were good, there would be no problems in motivation." That deflated us somewhat, I am afraid. However, the group agreed that not all instructors are good. No school has all good instructors; therefore, there is a problem.

We went on to define motivation, as it is given for us here on page 12 in the paper. I did not group-examine that statement very carefully but it was here, and we accepted it. Then we went on to say that the problems of motivation are basically the same as those of leadership.

It was pointed out that we are really not talking about a single problem here. There are different kinds of schools. There are different types of school missions. There are different sizes of schools, and they deal with different kinds of people.

Some of them have all officers as instructors, others use enlisted men, many use civilians, and some of them mix them all up together.

So we explored that area for quite a while, and reached these general conclusions:

In the case of the officer instructors, you have no real motivation problems in instruction any more than you have a motivation problem in any other duty. It is something that you can deal with, following the normal leadership pattern.

With the civilian instructor, you get into an entirely different field. There we undoubtedly have problems. We did not attempt to define them. The remark was made that if these people are unhappy, they tend to quit, and therefore, the problem tends to liquidate itself. However, no answer was brought up which provides the means for dealing with the basic symptoms of what makes them quit. If they continue to quit, you have really not accomplished much. We did not come to grips with that problem.

We recognize that among the enlisted men, particularly down in the short-term private levels, such as you often find teaching technical equipment, motivation tends to become a very serious problem. Again the answer is leadership, for what that may be worth.

Continuing with our conclusions, we did reach one very definite area of agreement. Initially, there was a doubt expressed that civilians and enlisted instructors can mix. The answer of the group is resoundingly affirmative; they can be mixed.

The group reached the decision that the instructor should teach the subject which, by his background and training, he is best qualified to teach, and if he is confident in his field, it makes little difference what he is or who he is teaching.

Some question was raised as to whether restrictions on subject matter by lesson plans, or POI's, and other administrative procedures tend to inhibit motivation. The group tended to agree they do not inhibit motivation, that a good instructor, properly supervised, properly led, has sufficient room to grow and to expand himself intellectually despite any limitations which are placed on him by administrative requirements.

A number of areas were brought out in which the schools themselves can control and enhance instructor motivation.

First and foremost among these we placed positive supervision. The group brought out the fact that there should be frequent inspections, and that inspectors, at the supervisory level, should not function as snoopers but rather they should encourage the instructor by showing him that the School is interested in what is going on and in what he is doing.

While recognizing that the schools will never come to the point where they can dominate the Career Management system, a means of getting better personnel was mentioned in the area of designating certain key instructor personnel, preparing detailed job descriptions for them, and then going up and selling the Career Management people on at least providing these designated few good people.

The general field of morale factors came up. It was the consensus of the group that is is nice to invite the civilians into the club. It is nice to have quarters on the post. It would be nice if the enlisted instructors did not have to pull KP, and so on. That is about as far as we got in that area.

The School indoctrination program was held out as a means by which the schools can control instructor motivation. The initial indoctrination was mentioned as a positive step in motivating them. It was also suggested and discussed that frequent supervisor-level conferences be used to bring the instructor up to date.

Service training aimed at the growth of the individual was mentioned as a means of motivating him.

Finally, there is a feeling, I believe, that if the school could enhance its over-all atmosphere so that it gets to be known as a desirable assignment, people would ask to come to the school. Again, getting back to our starting point, if we have all good instructors, this problem ceases to exist. If good instructors ask to come to our school, we have no problem.

Our recommendations were

We recommend that schools establish key personnel positions.

We recommend that privileges be extended to civilians and to enlisted men, in particular, in so far as is possible and appropriate.

We recommend that enlisted men be relieved from administrative duties, in so far as possible.

Finally, we feel that if the principles of good leadership and good supervision are applied, this problem is not an insurmountable one, and it will never get completely out of hand.

Are there any questions?

Thank you.

CHAIRMAN VALLANCE: Thank you for listening, or for not asking questions?

MAJOR GROVES: Both.

CHAIRMAN VALLANCE: There is still opportunity.

Yes, Colonel?

QUESTION: I do not want to wear out my welcome, but I am continually amazed at how these capable people summarize some of these discussions. I want to compliment Major Groves on the way he did that.

CHAIRMAN VALLANCE: Group 3 is next, Dr. McClelland.

DR. McCLELLAND: Group 3 had the assigned topic "Instructor Training Methods." Three basic questions were asked in the group. Should instructor training be centralized? How should instructor-training instructors, as well as instructor-trainees, be chosen? What should be the content of the course to be taught instructors?

It should be noted (as Major Groves pointed out earlier in the conference) that the representatives were from a variety of different military training school situations: some were entirely for officers, some were for enlisted men, some were mixed courses, some instructors were drawn from civilian and some from officer and enlisted ranks. In some situations the instructor was required to work on the platform; in others he worked only in a laboratory or in the field; and some involved both classroom and field. In some schools the topics primarily involve knowledge of tactics and procedures; others require fairly specific and detailed knowledge of hardware and materiel.

The first question (Should there be a required, basic, instructor course?) was generally answered in the affirmative. The reasons for this are several. Perhaps the most important one has to do with the need to achieve standardization at a high level of instructional quality throughout the school.

A supplementary issue involved the desirability of giving each instructor-trainee, prior to taking the instructor's course, a two-week tour of duty with the department to which he will be assigned. One school which has tried this found that there is a definite advantage in getting the man cold, before he has been exposed to the biases and prejudices of the department to which he will be assigned. It was reported, "You can 'learn him more and unlearn him less' under these circumstances."

Some schools require all instructors, regardless of previous experience, to go through the course each time they arrive at the school to instruct. The question was then raised: "Doesn't this result in all sorts of boredom and negativism on the part of the students?" The answer was "Yes," most of them complain. On the other hand, it was strongly felt that this requirement was desirable. It is just possible that course content or instructional techniques may have changed since the last school tour of duty.

It was further pointed out that in the courses in which officers are instructors there is a vast accumulation of experience. Almost all officers spend a good portion of their career teaching, formally or informally, in schools or on the job.

The question was raised as to whether or not you civilians, officers, and enlisted men should be mixed in any combination in a central instructor's course. There were differences of opinion and differences in procedure on this. Some schools separate officer and enlisted instructor-trainees; some combine them.

It was generally considered desirable that emphasis in the centralized instructor-training course should be primarily on methods, techniques, and

procedures in instruction. Although it is desirable to have the man come prepared to teach his topic, it is not realistic to expect him always to be well versed in the topic he is going to teach. This is about the only point discussed, incidentally, which touched on the point of content mastery.

The second general question was: How do we choose instructors? The group talked about one procedure only. It was suggested, and then rather spiritedly discussed, that the best source of instructors for teaching instructor-trainees was from the school staffs themselves. "Take the best available," was the general suggestion, "regardless of status." In this view we are obviously in agreement with Group 2.

There was some discussion as to whether or not enlisted men could teach officers. This seems feasible and has worked out in instances where the enlisted men were not in uniform. The ancillary question was also raised: "Should civilians teach officers?" The answer seems to depend on course content and on certain administrative considerations. The majority seemed to favor military men teaching military students. It was generally agreed that some people, regardless of the population from which you select them, or the training they receive, will never become instructors.

This led to the third question, "What should the instructor-training course content be?" There was a lot of discussion on the point, but I believe there was general agreement that instructor training does make a man a better instructor. I am not sure we are diametrically opposed to General Newton on this point, but at least we are not espousing a view that an instructor has to be born. Training can make a difference, can improve instructor performance.

In discussing the content of this particular course and how it should be organized, we succeeded only in listing a number of topics which might well be considered. Let me just read them very briefly: The ability to do research on the subject, to actually prepare lesson plans; knowledge of how people learn; knowledge of how to use training aids and devices effectively; knowledge of the "stages of instruction," the various steps in the teaching process, both what they are, and how to apply them; knowledge of student evaluation and testing procedures; knowledge of instructor evaluation (the point was quite cogently made that it is important for the instructor himself to know how he is being evaluated, for this is one way in which the standards of instructor behavior required of him can be communicated); knowledge of the facilities of the school, of the policies and procedures of that particular service institution; knowledge of effective communication techniques, such as use of voice, platform presence, and use of microphones; knowledge of various instructional techniques and procedures, such as conference and questioning techniques.

It was generally agreed that no single course is going to meet all needs. As Dr. Fields reminded us yesterday, the course purpose is going to dictate, to a large extent, what the content will be. Also, the size of the instructor training group and other administrative considerations are important in determining course content.

It was agreed that some sort of performance test, based on the content the man was going to teach, should be administered as a practical exam toward the end of the training course. Several other testing procedures were suggested, such as impromptu presentations, recording of speech, and critiques.

Conference Participants

Left: (L to R) Dr. William A. McClelland, Dr. Howard H. McFann, Dr. Joseph C. Hammock, Dr. B.D. VanEvera, Dr. Preston S. Abbott.

Above Dr. Robert L. Thorndike and Dr. Meredith P. Crawford (R).

Below: Dr. R. W. Scott, Major Mary E. Kelley, Mr. James L. Foster.

in informal discussion....

Right: Major Richard S. Groves, Dr. Edward E. Pickard, Dean O.S. Colclough.

Above: (L to R) Major General Edmund B. Sebree (Retired), Dr. Ralph R. Fields, Colonel John Ray.

Below: (L to R) Major William Stendeback, Jr., Dr. Rolfe L. Allen, Lieutenant Colonel Fred A. Hicks, Dr. H. Jackson Darst.

One pertinent point was made at the very end of the discussion. If the instructional technique which is being used is the case-study method, many of the considerations noted earlier may not be applicable.

In summary, then, the instructor-training methods group agreed to three major points: First, standardized instructor training is desirable in a centrally administered facility; second, training can indeed improve a man's instructional abilities; and third, no single course is going to meet all instructor-course needs.

The group did not have any recommendations to offer as a result of their deliberations.

Are there any questions or corrections from the floor or from members of Group 3?

Yes, sir?

QUESTION: Did the group decide that the Army should have an instructor training school or course?

DR. McCLELLAND: Centralized instruction refers only to the specific school involved, not to a single central Army instructor school.

QUESTION: Was there anything decided as to the length of the training course? Should it be two weeks, three weeks, or six weeks?

DR. McCLELLAND: I have a fine cliché to offer in answer: This depends upon the purpose of the course. Let me add, however, that we talked about courses which ranged from 24 hours up to six weeks. Although there was general agreement that the current length, whatever it is, "ain't enough," some people think you can get quite a bit across in a traditional two-week course.

GENERAL NEWTON: I want to clear up one point. In regard to my question of "Being born," it was not instructors, it was leaders. Instructors can be trained.

DR. McCLELLAND: Good. I'm happy you corrected me.

GENERAL NEWTON: The enthusiasm and initiative is inherent. It is difficult to train those elements into a man if he doesn't have the spark initially; to build a fire, he has to have it.

CHAIRMAN VALLANCE: We won't attempt to resolve that question.

QUESTION: When we talk about two weeks being sufficient for our purposes, at least in part, I think we ought to note several deans of colleges of education that take four years have just now turned over in their graves, comparing two weeks with the traditional four-year course.

How much is enough?

GENERAL NEWTON: I think the answer to that is how good the Army school system is. We have a fine system of education in the Army.

CHAIRMAN VALLANCE: The fourth group was concerned with evaluation of instructors. Here comes the reporter.

MR. NAY: Group 4 in this session concerned itself with the topic: "Whether and, if so, How to Evaluate Instructors."

Using as a point of departure a statement of General Newton in his presentation, that instruction is an art, we found that the artist performs, and that any time a performance occurs, it is subject to judgment or evaluation.

So the conditional elements of our topic "Whether and, if so," we immediately eliminated. We were left, then, with the question of how it is to be done, that is, the nature of the activity.

There will be evaluation; it is inherent in the situation. But, reducing the topic simply to the problem of "how" aroused other elements as well: What purpose will be served by evaluation? Who shall do it? And what shall be evaluated?

So we looked first at purposes, and we found immediately that the primary purpose for evaluation of the instructor is to assist him in refining his techniques.

But there was something more underlying than that, because the purpose of instruction is to facilitate learning. In evaluating instruction, we are indirectly assisting or facilitating the learning process on the part of the trainee, with this limitation: that evaluation of the instructor is not the only way by which we can facilitate learning. That is one device.

Therefore, it developed that we must evaluate instruction as well as the instructor, instruction in terms of course content, organization, adequacy of coverage of the material. Those elements of instruction are one kind of matter subject to evaluation, and the presentation by the instructor is something else.

To do a proper job of evaluation, two kinds of persons are needed: one is the expert on the matter of instruction, the technical man; the other is the professional man, the one who is expert or knowledgeable, at least, in the matters of training and education.

Now, with the subject matter so divided, we found that we will make a double type of evaluation. We will evaluate instruction—including the material, the facilities—and we will evaluate the instructor—including his presentation, and how he uses those facilities.

There is one other element of evaluation which we come to: who shall do it?

The question came up as to whether the trainee should evaluate the instructor. We found that there is a place for student evaluation of instruction, considering the limitations within which it can be accepted. We found that student evaluation can give us a great mass of data which, therefore, will reveal trends to us, but will never pinpoint in the way that a technical director of instruction, or a professional person, knowledgeable in teaching, can pinpoint matters for improvement on the part of any individual instructor. Student evaluation is limited in its validity, we find, to trends rather than to specifics.

We looked at what is the purpose; we looked at who shall do it; and then we finally looked at how it shall be done.

We found that it can be done, to some extent, by reviewing the records of achievement on the part of the classes. If they are good at the end of the course, compared to being not so good at the beginning of the course, and you have tested them at both ends—if their achievement has been what it must be to fulfill the purpose of the course—then the instruction must have been good.

But we found that that method was indirect, and it was a way of evaluating instruction which, should it not have been good instruction, would be noted a little too long after the horse has been stolen.

So we find that we have got to do some leg work, and actually get into the classes continually, recurringly, but irregularly, kind of by surprise. We have to be with these instructors on a personal man-to-man basis to a degree that they will not feel tensed up and ill-at-ease when they know that in the room there is someone whose job it is to write them up if called for.

We want this evaluation to be so recurring, but not regularly recurring, that the instructor would have invited you in, if you did not come in the first place. When that situation exists between the observer and the instructor, then it results favorably; the results of that observation will be wholesome for both.

So we need much evaluation by actual observation.

Now, shall we measure this on some kind of a numerical rating, so we can rank instructors? Our group does not approve of that. We approve, rather, of using a record of observation as a means of guidance for the instructor, as a means of reporting to his director those elements of instruction that are open to commendation and those elements that are subject to improvement. But it should not be used as a means of ranking individuals, with one small exception: in some of the institutions we find that civilian instructors are rated on their instructional ability, for purposes of establishing that discrimination among degrees of superiority so that those qualified may be recommended for outstanding performance awards.

That is the only reason why we would rank instructors. Otherwise, the expression we used in our group to describe that procedure was "deadly." We do not do it.

We concluded with this final point, that the most important aspect of this whole observation procedure is that the tone in which it is conducted be on an implied invitational basis, and that there be in connection with it a direct feedback, a report to the instructor or a counseling conference with the instructor, so that he will know the score immediately, as soon as possible. We want him to know the rules of the game, and what the score was, directly and right from the observer himself.

That brought us up just at four o'clock, and we were able to make our deadline up here.

CHAIRMAN VALLANCE: Thank you, Mr. Nay.

Will there by any question from the group, or elsewhere? Mr. Porter.

MR. PORTER: I do not believe I understood this student evaluation of instructors. Is that actually taking place somewhere?

MR. NAY: At the end of the course, or at the end of a block of instruction in some instances, or every two weeks in some instances, students are asked to evaluate not only instructors, but the facilities with which they are instructed, "What kind of barracks do you have?" "What do you think of the PX?" "Is the mess hall serving good chow?" And including: "What do you think of the instruction you are getting?" It is one element of a general evaluation survey.

CHAIRMAN VALLANCE: Another question? Very well, Mr. Nay. Thank you very much, again.

CHAIRMAN VALLANCE: Now, there are two more things I would like to make reference to before we adjourn. Do not pack up quite yet.

I am asked to remind the educational advisors of the interest in a continuing meeting in this room, after the adjournment of the assembly. That is one thing.

Second, there is an item of interest in G-3 CONARC with reference to one of the subjects we were discussing yesterday. Colonel Baker, from that section, has brought it to my attention and would like to bring it to your attention, with the invitation, I trust, that you discuss the matter with him, give him any ideas that relate to it.

I would like to turn over the remaining bit of our time to Colonel Baker.

COLONEL BAKER: This is a problem with which I am sure the majority of the people here are familiar. It is a problem which has increased over the past year, due to the increased complexity and technical knowledge required for the new weapons system. It is further complicated by the reduction in personnel and funds with which the Army is faced.

General Wyman made some reference to it in his speech, in his discussion of the increased missions which the schools have, and I would like to elaborate just a little bit on that.

The increased technical knowledge required to maintain the weapons system can probably be taught better and cheaper in the schools than any place else in the Army system. However, CONARC has had imposed, and I assume the Department of the Army has had imposed on them, a ceiling upon the number of individuals who can be trained in the school system.

Now, to arrive at the number of personnel that can be trained in any given school within the ceiling imposed, we have a formula which we use. The formula is the course length in weeks multiplied by the training requirement (or input) divided by the number of training weeks available, which is 50. Now, the last is not variable. This we cannot change. We have only 50 weeks in a year in which to accomplish this training.

The course length is variable, and the input is variable. However, right now, because of the technical knowledge required, course lengths are increasing; the input into the schools is also increasing. So we are faced with an incompatible situation. We still have to remain within the ceiling imposed by D/A. I think all of the schools have had their input reduced, that is, the number of spaces or number of people they can train, in the past three or four months. As a matter of fact, I think CONARC has received some 13 different changes to the student load, of which four, I think, have been passed on to agencies in the field.

Since the student input is increasing (we cannot reduce that), this leaves us one area in which progress can be made. This is the area of the course length, and this can be reduced in two ways: one, by the elimination of nonessential courses; and, two, by the elimination of nonessential subjects from courses presently in existence, or from courses which are being established.

Now, this means that each school, each service, each branch of the Army must take a realistic look at the training program, to eliminate nonessential subjects and courses. If we do not, I think there is danger ahead. Last year we had a large number of individuals who were not trained, because we did not have the space; this year, it will be larger. If this continues, we will be faced, eventually, with a half-trained Army.

For the other thing I would like to offer for consideration, I will refer to D/A Training Circular, No. 1. This we picked up in reviewing your programs of instruction. Training Circular No. 1 says that—and when I speak of "training," I am talking of the training, the MOS training or specialist training, not of the education courses—"Training in peacetime and in mobilization should be the same." You should not train a man for a job which requires six weeks in peacetime and only four weeks in mobilization. If this is the training he requires in order to fight, he should receive

the same training in peacetime, and no more. This is an area which we consider to be seriously violated, as invariably the mobilization course, in academic subjects, is shorter than the peacetime program.

I offer these to you for your consideration. We do not have the answer at CONARC.

QUESTION: On these courses being shorter, we have a 15-week course in peacetime. It would be shown as 14 in mobilization.

You are talking about hours?

COLONEL BAKER: I am talking about the hours devoted to academic subjects. There is a difference in course length, based on in-and-out processing. There is a difference in the number of hours of training weeks.

In other words, we go from 40 to 48 during mobilization. This, we realize, will shorten the course, but it should not change the number of academic hours required to train this individual.

Are there any other questions?

QUESTION: One thing on that. For your mobilization training, you are going to have lots of men to pick from with a background. By utilizing the background, academic background, degree in Physics, Nuclear Physics, you are going to be able to utilize some of the material. If you do not do that, you fail to take advantage of some of the resources you have.

COLONEL BAKER: This is an assumption you make that you are going to have the number of personnel required who have this background; and I do not think that that is a valid assumption.

QUESTION: The course requires selectivity.

COLONEL BAKER: That is correct. If you get people with this background, then, you can put them through a course which is tailored to their individual needs. This is certainly a saving. However, we cannot assume that we will have the required number of individuals in any given field who have this background. So we must have a peacetime and a mobilization course, to start the training of the man at scratch, and prepare him for duty. This should be, in academic hours, exactly the same.

QUESTION: Did not the directive put out in the field encourage shorter courses during mobilization?

COLONEL BAKER: Dual program, POI, letter from CONARC, did say, if I remember correctly, that there was authorized a 10 per cent reduction in length. I can only say that we in the Schools Branch do not agree with that at the present time.

QUESTION: That circular I think you referred to, is that D/A Training Circular No. 1?

COLONEL BAKER: Yes, D/A Training Circular No. 1. I believe it is in the process of revision.

It is an old one, about 1950, if I am not mistaken.

Any other questions?

QUESTION: Is CONARC going to change that letter with which you do not agree?

COLONEL BAKER: We are recommending that it be changed.

Any other questions?

Thank you, Dr. Vallance.

CHAIRMAN VALLANCE: All right, we will consider ourselves adjourned until the evening gathering.

(The meeting was recessed.)

Above: Lt. Gen. James M. Gavin, Army Chief of Research and Development, shown in conversation at the Educational Advisors' Conference Banquet. From left to right: Dr. T.R. Vallance, Deputy Director, HumRRO; Dr. Meredith P. Crawford, Director; General Gavin; and Dr. B.D. VanEvera, Dean for Sponsored Research, The George Washington University.

At right: General Gavin addresses the banquet audience. Seated is Dr. Crawford, who introduced the General.

Conference Banquet

Wednesday, 29 January 1958

INTRODUCTION OF GENERAL GAVIN

DR. CRAWFORD: The theme of our conference has been centered about the man, who plays the key role in the Army weapons system, whether he is pulling the trigger of the M1 rifle or pressing the final button at the end of a suspenseful countdown of a guided missile. The importance of the proper training of this man has been clearly recognized in the research and development program of the Department of the Army. While it is natural that the major attention of research and development has been devoted to matters of materiel and equipment where science and engineering have long since proved their worth, the Chief of Research and Development has vigorously supported research for the improvement of the capabilities of the soldier himself.

Our speaker of the evening has brought to his task as Chief of Research and Development the complete perspective on the man in relation to the machine which he has gained from his distinguished record. This experience has been most incisively applied in a balanced program of research and development on all aspects of our weapons system. Because of his particular interest in the soldier himself and in his detailed training, we feel that this conference is particularly honored having him speak to us this evening.

I have the honor to present the Chief of Research and Development, Lt. Gen. James M. Gavin.

Address

Lieutenant General James M. Gavin

CHIEF OF RESEARCH AND DEVELOPMENT,

DEPARTMENT OF THE ARMY

GENERAL GAVIN: Dr. Crawford, distinguished guests, ladies and gentlemen:

I am delighted to be with you this evening. I have long had a deep and abiding interest in the problem of humanity, and humanity in uniform; and I have long been preoccupied with some concern for our comparative degree of neglect of the human factors in our military problems.

As a matter of fact, I have just come from a very long trip, just back to the office today. I am well on the way to finishing the "Organization Man," which a lot of you have read, I am sure. Again, I am impressed with the amount of time, industry, effort, and so forth, expended; he must deliver the goods. And yet, man is our very commodity, our very life-blood, the salt of the earth to us as a soldier. We have as yet devoted but a small part of the effort we should to understanding him and understanding his motivations.

I say this as an aside in starting.

Specifically, to come to this meeting is, of course, a matter of great personal satisfaction—to have this opportunity to talk to you, here together, the educational advisors of the Army schools and our HumRRO scientists, charged with research, to improve the Army's training. I would like to take this opportunity to outline and reaffirm three particular points:

First, the basic principles which guide our concepts of the role and mission of Army training and education, and the support which research can give that mission.

Second, the nature of the support which Army Research and Development, as exemplified by HumRRO, can give to that mission, and has given in notable cases.

Finally, the actions which Army educational advisors can take, both to strengthen and to exploit this research and development support.

We live in a society in which great public attention and newspaper front-page space is focused on the exotic hardware which future warfare will require, and the tremendous sums of money which their development

and procurement must consume. I certainly am well aware of this, and I do not complain of it, but simply state that it is a self-evident fact which you HumRRO scientists and you educational advisors must have noticed.

If you are aware of it, I would caution you not to be misled by it. I caution you not to fall into the easy error of supposing that these column inches of newsprint or these mega-digits of dollars furnish a true estimate of the relative importance of these interesting and costly equipments. I do not deprecate them. In fact, I put it to you with all the sincerity of my experience as a professional soldier, that they are necessary in the utmost degree. These equipments are necessary, but not sufficient.

I would remind you of a fact which the headlines (and the columnists) frequently overlook: Man is a weapons system. Man is our most precious commodity in the Army; man is a common denominator of our entire military effort.

I suppose you have heard this, and by now it may be threadbare, but I impose upon you to repeat it; not only is he the most precious commodity in our inventory, but the lead-time for a trained, ready, fighting man is longer than for any other item in the Army's inventory, and we therefore must take the best possible care of him.

And, of course, man himself is the simplest form of weapons system. Now, that word is so often used, "a weapons system," and, of course, it is nothing more than a combination of the means to acquire a target, to move and deliver a blow, and to appraise the results. Mobility, a blow, and a central nervous system, to bring these into proper coordination—man is truly the simplest weapons system of all.

Now, in what time we may have that remains, however long or short, between now and the terrible day when diplomacy may fail, and men explode their greatest engines of destruction, the soldier will be the man we will have to devote our greatest attention to. In the sudden seeming quiet that follows that explosion, in the sudden seeming quiet that would follow the outbreak of any conflagration, the soldier will again be the weapon by which we will enforce our national will to restore order, to restore freedom. It is the basic mission of Army training and education to produce men who can respond to the national-international challenge in such an hour of crisis.

Since the man is a weapons system, it follows that Army schools must keep constantly current on the ever-developing doctrine for the strategic and tactical use of that weapons system, man himself. We cannot afford to permit either our schools or our research to enter an "atomically muscle-bound" state of restricted strategic capability. Somehow an assumption that weapons have ceased to serve man, and from now on man merely serves them, and is responsive to them, is the most dangerous pitfall that I can conceive of us falling into. Those of you who know me well, know I believe this profoundly, and I have written on it at some length recently. We must really, at all times, be guided by the constantly up-to-date concepts of our offensive and defensive battle tactics, and the weapons systems we are developing, to make possible those tactics.

Army research and development is vitally concerned, on a broad front, with understanding human factors directly in these terms of the strategy and tactics pattern of future warfare. The Adjutant General's Personnel Research Branch is actively seeking improved means of measuring

and predicting battle performance, for use in selection and assignment of combat arms soldiers and office leaders, of all ranks. The Technical Services are vitally interested in human factors engineering, to be sure that the design of new equipment is compatible with the abilities and limitations of the troops who must use them.

The growing array of complex equipment in the Army's arsenal increases the emphasis on another dimension in training research—the development of synthetic trainers and simulators. I might say again, in reaffirmation of something I have been saying in Washington for four years, that the increasing complexities of war clearly make evident the need for manpower in greater numbers and better quality than anything we have known in the past. And, as a matter of fact, to return to the very point I made a moment ago, as manpower clearly becomes less abundant you will need simulators more and more in your weapons systems, for combat as well as for training.

Missiles and other costly equipment are so dangerous, so complex, and so expensive, that it frequently is not feasible or practical to employ operational equipment during training. You know this will be true in the big missiles we have coming along now, for example; and it will be true in the other unmanned vehicles we have coming along, too. This means that synthetic trainers must be used to provide realistic training to insure against human error. Thus, we have recently developed a full-scale Redstone simulator, which has all of the training characteristics, connections, gauges, informational inputs and outputs, of the missile itself, except, of course, its actual launching.

The human factors research and development activity which most directly concerns you is your host for this conference—the Human Resources Research Office. I shall, therefore, confine the major portion of my remaining remarks to this activity.

Both the CONARC and the Army Command Research and Development Office have persistently guided the research of HumRRO along the lines that I have discussed so far.

Throughout the HumRRO organization, the effort has, in all ways, been to combine the professional know-how of the soldier with that of the scientist. Admiral Rickover has seen this principle work to good effect in the development of the Navy's atomic submarine. I believe we are seeing it work to the same good effect in a different technical area in HumRRO.

The HumRRO field units at Fort Knox, Fort Benning and Fort Bliss are deliberately situated to be associated with these major centers of the development of Army tactical doctrine.

I am particularly pleased to note that in each instance in which the Army Scientific Advisory Panel has focused its concern on our human factors research, it has done so against an explicit background of the anticipated nature of the battle area of the future, and the work that HumRRO is doing in this area.

HumRRO research and development, so guided and conducted, has paid off handsomely, and will continue to do so by providing the Army with improved means to increase our strategic and tactical capability within a specific quantity of manpower. The best single example of this pay-off, that comes to mind of course, developed at Fort Benning and introduced at training

centers in 1957, is the so-called Trainfire system of rifle marksmanship training, with which I am sure you are all familiar, or should be. This new system increases battlefield proficiency, decreases training time, saves trainee and trainer man-hours; improves motivation for marksmanship; and offers long-run cost savings for range facilities.

I have every expectation that improved capability of a similar or greater magnitude will result in the future from the HumRRO work now underway on a number of projects. Just to name a few: the training of tank crewmen, and measurement of their proficiency; the exploitation of the ability of higher-aptitude men to assimilate basic training more quickly, and thus to have a longer productive period in the Army; the improvement and reduction of our excessively lengthy electronics maintenance courses, which, as you know, are very long now, 35 weeks for some of our people in the NIKE systems; the determination of the major trainable components of effective performance of patrol tactics; the forecasting—and I am listing the areas in which HumRRO is making direct contributions—the forecasting of qualitative training requirements for operation and maintenance of future weapons systems; and the measurement of the effectiveness of combat leadership and the enhancement of its trainable components.

As educational advisors, your first task, of course, is to be alert to seize upon and exploit to their utmost the new developments which come from this research. While this is important, it is so obviously necessary that I shall not dwell on it here, except to acknowledge that it is not always easy. Because it is sometimes difficult to do this, I would expect that HumRRO's researchers would always seek to take every appropriate step to assist such exploitation.

Beyond this, however, there is a more important contribution which you can make as educational advisors. This contribution is, in part, exemplified by the present conference; it consists in the active participation in guiding and shaping the very research which you will later seek to exploit. A single immediate example will illustrate my meaning, and thereafter I would pose a few further questions as worthy of your thought.

As the immediate example, I might point out that future armies must be able to move and fight at night with the same or better facility than they possess for daytime operations. When I asked the staff about this point, they said that in the future we should be able to move and fight at night, with the same facility as in daytime operations. I changed that to "better," because I am convinced that we must do all of our operations, almost, at night; and you gentlemen must train our people so they can operate at night. And I, as a research and development man, will see to it that we get equipment to enable us to operate at night.

It is a simple point, but really a very important one, and the suggestion is that some radical changes should be made in our thinking. You are probably aware that the physical sciences can be, and are, called upon to invent hardware to assist this capability. Beyond this, however, the Chief of Army Field Forces, some years ago, directed that at least one-third of individual and team tactical training be conducted during the hours of darkness. In addition, you will note that HumRRO is currently conducting research designed to enhance the effectiveness of this training.

This always seemed a matter of great interest to me, that at the outset of hostilities, viewing the long period of combat as a whole, upon the entry of a new unit into combat, it attacks in daylight; the older in combat the unit gets, the more it fights at night. During the last war, the normal time of attack was two or three in the morning, perhaps four at the latest. It is obvious from experience that there is where skill and training and confidence achieve the margin of advantage you need to win.

Now, next, then, is a question I suggest for you to ponder over: Is this present HumRRO program on armor training for night operations sufficient? Are we doing enough? Do the other combat arms not also fight at night? And can we not do a great deal more? Can research contribute to this? Now, how about our operations in the polar regions? How about operations in other extremes of the spectrum of environment?

Let me, as an aside, say, pose this first question to you: How goeth the republic? Where are we in the state of its history? Are we, as a young man in the midmorning, full of enthusiasm, given to fits of anger, peaks of elation and depths of depression? Will we make an abundance of mistakes in our enthusiasm?

Have we, in fact, approached a zenith, and has Korea marked a turning point? Where are we really?

I believe we are well into the early morning, on the way up the scale. If we are, we should think in terms of past history and realize that great people have become great people and have survived, only because they have been able to do things where, theoretically, it was impossible for human beings to do things.

And then I bring this right home, in this way: you and I have been inclined to consider the temperate zones, the normal zones. Anything outside of that is the unusual, abnormal aberration, the extrapolation from the norm. Isn't it time now, as we look to the shrinking size of the planet—and it has shrunk to the smallest size now, it takes 90 minutes to go around it, you know, and that can be significantly reduced, and will be in the not too distant future—should we not be realizing that the extreme environments on the spectrum are the norm, and we must be able to perform as well (or better) in the extremes as we once did in the temperature zones, and consider the temperate zones as just something nice to happen to come to us? I suggest that this is really the way we should look upon it. We are trying to do this in Research and Development. That is the reason why we established an Office of Polar Research.

I would like to ask you a few other questions now:

Are all means being explored, even to such apparently speculative measures as subliminal perception, for the improved training and motivation of our people at all grades? I talked to Dr. Baker about this. I am not at all satisfied that you gentlemen have really begun to approach the problem. I think you mince up to it conservatively. I wish someone could find a way of jumping the brackets, putting a bracket beyond the maximum gain in training, and make an error in going too far in getting the most out of the human being; and show me where I can optimize, not slowly approaching it but trying to get more. I think we must be venturesome, any way, one would do this in research and development. You know, in research and development, if you are really not developing—what?—50 per cent clinkers, you are not doing

much good because you have to make mistakes. And the most difficult decision is to stop something, not to start something. Anybody can start something. I would say in human research anybody can start new things, and there should be a lot of them started. Have the courage to start so many new ones that you will have a lot of them. Then stop them when they are not paying off.

But I would like to see a bracket gain in what we consider the optimum methods. I think subliminal perception is one of the areas we have hardly begun to try.

Again, I ask you: How can we interest our officers and men in the nonresident instruction program, to keep them abreast of the rapidly changing concepts and techniques of warfare? For example, are these programs themselves kept up to date to get most out of the time that these people have in the service?

Still again: Within our tight and crowded schedules, how can we package our instruction best to assure retention of the learning achieved?

Well, I could run down these questions for a long time. I am afraid I am boring you to death with them. I am not going to do it. You must have a great deal more that come to mind.

May I simply encourage you to continue to pose such questions, and to persist in exploring our research and development resources, including HumRRO, to assist in finding answers to them. Above all, let me exhort you to persist until the answers are found.

I believe that here we have in the United States Army something unique, without precedent, and something that yet may be the greatest pay-off technique that we have brought into use, the really great innovation, certainly with the manpower problems we face, and the highly complex weapons systems in prospect, something such as this—the HumRRO system. Through its association with our educational advisors we can gain the ends we seek, and thus gain the margin of advantage we need with inferior manpower, if this is the situation we are up against, to win in battle. I would urge a very, very venturesome and aggressive approach to the entire problem, and in no way accept in a rather complacent form the present effort as being the best effort.

May I say in conclusion that in these few minutes I have indicated to you the basic principles by which training and research in the Army are guided and geared to our battle mission. I have indicated how our research and development resources, particularly HumRRO, can be and are devoted to the support of such training. I have suggested means by which the Army's educational advisors can assure even greater support in the future.

I would be woefully amiss if I did not, in this final opportunity, acknowledge and commend the fine teamwork evidenced by this conference itself, and by the many fine officers, scientists, and educators, who carry the burden of our training operations and our training research. Speaking particularly for my own part of this complex Army problem, the research and development aspect, I wish to offer my sincerest congratulations and gratitude to Dr. Meredith Crawford for his fine leadership of HumRRO during the past years I have been associated with it. I am in complete agreement with the judgments which I have heard from many of your eminent professional colleagues, that in HumRRO you have created the

most outstandingly competent military training research institution in existence today. To all of the members of your team, and to this conference, I give a "Well done."

Finally, may I use a Biblical quotation which I have used in the past—perhaps rather thoughtlessly, but I give it with some sentiment now, because I believe it never was more applicable:

"Without vision, the people shall perish."

Never has there been any greater need for greater vision. But more than vision itself, what is needed is the moral courage to express the vision, and the moral courage to stick to your principles, once you have expressed your vision as you see it.

With the human resources of our great country, with you great people working with the resources, with the natural resources of this country, as we have in great abundance in our industry, and with the help of God, we can survive as a people with vision. But we must have vision, and the courage to express it when we see it.

It has been a great pleasure to talk to you.

Thank you very much.

(The assembly adjourned.)

FIFTH GENERAL SESSION

Thursday, 30 January 1958

Improving Instruction Through Better Methods and Training Devices

CHAIRMAN VALLANCE: And another good morning to you all.

Having spent a few days on training methods and the instructors, we move a little further along the line of becoming more specific to consider such things as how we can help the instructor do his job, and how we can find new needs of the instructor for additional training devices, simulators, and so on.

I believe there is more to the training aids in this simulator business than apparently meets the eye, and we are again fortunate to have among our resources a man who has spent a great deal of time thinking and doing research on training aids and simulators and their role in the instructional process.

That man is Dr. Clifford Seitz, Chief Psychologist of the Army Participation Group at the Naval Training Devices Center, Port Washington, Long Island.

Without further ado, then, I will turn the meeting over to Dr. Seitz.

DR. SEITZ: Thank you.

Good morning. Before I tell you what I came here to say, I would like to give a few words to the Navy Training Devices Center at Sands Point, Long Island, just in case some of you are not fully acquainted with that operation.

Briefly, the Navy Training Devices Center was started about 1942 as a desk in the Bureau of Aeronautics under Commander DeFlores, now Admiral DeFlores. The purpose of the setup was to provide, particularly to the Bureau of Aeronautics, the training aids and devices which woulf facilitate and help speed up our training of aviation crewmen and pilots.

That operation grew out of a garage in Washington to a large estate which we now have at Sands Point. And some years later, the Army and the Navy, by agreement of the two Secretaries, decided that they would operate the facility together. It is still a Naval command, but its Associate Director is an Army Colonel; by virtue of this, and the Army's Participation Group, we operate as one unit. The Army officers who are with the Center serve you

through the facilities that we have, both through our branch offices and through the Engineers and other professional and technical people we have at the center. They operate with these people to provide you with aids and devices that you require. So I think you can properly feel that although this place is called the Navy Training Devices Center, it is also the Army Training Devices Center, and the full resources of that facility are yours.

In the event some of you do not know the Associate Director, I would like to introduce to you Colonel Hunter, the Associate Director, NTDC.

COLONEL HUNTER: Good morning.

DR. SEITZ: The announcement by Russia of the firing of an ICBM was greeted with astonishment and not a little skepticism in some quarters. The global halos of Sputniks I and II, however, leave little doubt that at least one potential adversary is rapidly equalling our industrial and technological growth. This has serious implications for the Armed Forces. In the future we may not have importantly superior weapons, or more of them. Our use of what we have may be the measure of difference. How we use what we have depends principally on human performance, and this in turn on training. In the development of military skills—from decision-making to twirling—training devices can make a significant contribution.

In the race to build bigger, better and more complex weapons systems, almost no stone has been left unturned. The contribution of the physical sciences has been so significant, and the recognition of the scientists involved so widespread, that the Fermis and Tellers are almost the popular heroes that baseball players are. I said almost—when I spoke a moment ago of upturning stones—for a reason. The human factor has been badly neglected, neglected in the design of much of this equipment, and more importantly in training for its use.

A review of the history of warfare will bring to mind examples of victories by forces inferior in numbers, in equipment, and in tactical deployment. The way in which these forces used what they had, their skill in battle—and all that this means—spelled the difference. It was courage and motivation I am sure, but these abstractions are in substantial ways the product of confidence born of knowing what to do and how to do it.

We all admit the importance of training, but we tend to think of it as a support operation, separate from the system's development—everybody's business. This has important consequences.

For example, one of the most important operational missile systems the Army has—the Nike—has benefited notably from the use of the Radar Signal Artillery and Guided Missile Operator Trainer.

Radar targets are supplied synthetically; aircraft at Mach I do not have to fly in order to provide radar training; the cost per hour of jet aircraft operation, and the attendant hazards have been markedly reduced. Operational readiness is improved. But when was this device ready to go? Several years after the Nike system was operational. Why did this happen in a system as critical as Nike? Because training planning is too little, too late, and because too many people—for one reason or another—either do not know, or are unwilling to admit that training equipment is the answer to a substantial portion of the training line. And, as you know, the training line is a critical one in the system. It may well be our secret weapon, and it is a weapon which we shall show can be bought at relatively low cost.

What, then, can a training device do? A flexible gunnery trainer brought personnel in one week to a proficiency level equal to gunners with years of experience. And it was not necessary to run jets or patrol planes for days on end under continuous hazards and at awesome cost. A technique in marksmanship using synthetic targets and small caliber ammunition saved $4.50 per trainee, increased his proficiency, and did the job in less time. One-half million trainees at this rate would produce superior forces at important savings. Elements of entire Naval task forces can maneuver against an enemy, defend against airborne and surface attacks, appraise their performances, and never have to leave a building in the process. This is done with an air defense trainer.

The letterhead of the Naval Training Devices Center contains the phrase "tools for more effective training." This phrase has the Madison Avenue touch, we hope, but it is much more than that. It describes several important features of a training device. A training device is a tool and, as a tool, is an important and often necessary factor in doing the job. It will not do the job alone, however. It must be proper to the job—pipefitting with a bandsaw can be an exasperating task—and it must be properly used. Pete Smith has made a fortune with films demonstrating the disastrous, if humorous, consequences of giving the average husband a box of tools.

The other key word in this phrase is "effective." The fact of training is universal to the Armed Forces. No other large segment of our society talks more or, in fact, spends more for training. The principal peacetime mission of the Armed Forces is training. Unfortunately, the effectiveness of this training is not in proportion to the effort and funds expended. We are plagued with developing adequate measures of effectiveness, and we are faced with an important attitudinal problem. That is, there is a general failure (in part because the subject is warfare, and in part because so much equipment is involved) to recognize that training is not primarily an engineering problem, a tactical problem, a logistic problem, or a management problem. It is all of these, of course, but it is first of all an educational problem and must ultimately be solved through the use of educational techniques. When we speak of effective training, we are talking of these techniques, blended with all the other skills mentioned. Let us get down to cases for a moment and then speak of an ideal training system.

These examples indicate that we have the techniques and we have the tools—not all of them, but many more than we apply. In fact, the adequate provision of training systems is an exception rather than a rule. One of these exceptions is the Fire Unit Proficiency Analyzer for use in training Redstone Missile Battalions. I should like to describe this system briefly.

The Redstone Fire Unit Proficiency Analyzer, or FUPA, as it is called, came into being as the result of a requirement from the Army Ballistic Missile Agency for a synthetic Redstone which could be distributed to deployed firing units and used in the field to practice firings and to gain a measurement of the ability of launching crews to prepare the missile and fire it successfully. The requirement reached the Naval Training Devices Center, a bi-service organization, through its Army Participation Group.

Essentially, the FUPA consists of a dummy missile and an electrical simulator. The dummy is full scale, identical in internal and external appearance with the operational Redstone itself. The black boxes are all

there, but in dummy or mock-up form. But these dummies, which represent systems and components which the firing crew has to check, adjust, repair, or replace on the actual missile, are live dummies. Their inputs and outputs read the same on the missile test equipment as if they were operating in the real Redstone itself. The dummies are activated to give their responses by means of the simulator. And the simulator is as simple a piece of equipment as is possible to design, emphasizing straight electrical circuitry and trying to avoid any electronic or computing elements.

The simulator, which is contained in a small truck of its own, determines the condition of the dummy missile. It does two things at once: (1) it synthetically activates the operational fire control panels contained separately in the fire control truck, (2) it synthetically, simultaneously, or correspondingly, activates the dummy components in the missile.

Over 100 malfunctions can be introduced by the instructor through the simulator. If he wants to simulate a defective gyro, he flips a switch and the fire control panels and dummy gyro box respond accordingly. The crew then has to prove its ability to detect that malfunction, locate or isolate it, and remedy it by adjustment, repair or replacement made on the dummy missile. What they do and when they do it is automatically recorded for post-exercise critique.

The gyro box, of course, contains no costly precision gyro. It contains no gyro at all, just simulation circuitry to provide the right or wrong test equipment readings. Realism does not suffer. In fact, the device goes out of its way to guarantee realism. If that same gyro box happens to hum, hiss, or vibrate in the actual Redstone, and if these are cues used by firing crews in trouble shooting the missile, then the dummy box, too, is made to hum, hiss, or vibrate.

The synthetic Redstone is intended to be handled by the operational or tactical crane, to be set upon the operational launching pad, and to be connected to the tactical LOX trailer, alcohol trailer, power sources, and, of course, fire control truck. By means of quick-disconnect attachments and external fittings, it is powered, receives its high pressure air, and is even fueled—although in a very limited amount—exactly as is the genuine missile. All this is done—and without degradation of the operational or tactical support equipment. The time required to change over from a training to a live firing situation should be about 30 minutes.

This Redstone FUPA was delivered to the Army on September 1, 1957, which is one year from the date we started. Four production units are also being procured for delivery early this year. The synthetized missile, exemplified by the Redstone Fire Unit Proficiency Analyzer, has certain very strong advantages:

(1) It eliminates the need to fire and expend costly critical operational missiles—something which the national economy could not long endure on any large scale for strictly routine training purposes.

(2) It enables dry runs to be practiced repeatedly without degradation of the operational components. Experience shows that operational equipment repeatedly used for training has a life expectancy of about three months.

(3) It enables controlled malfunctions, the best test of training effectiveness and personnel proficiency—something virtually impossible to

do in any variety or number with operational missiles. In this respect, it is even better than the real missile for training purposes.

(4) It enables training to be carried out and firings practiced without the need for instrumented range and without involvement in the money and scheduling problems of such a range. Similarly, the problems of air space, impact areas, and security are eliminated.

(5) It increases safety by reducing the use of dangerous materials, lessening dangerous pressures—in this case without the knowledge of the student—and eliminating the other hazards of actual firings.

(6) Being a mock-up, it can be more easily modified than operational missiles to keep pace with changes in the actual hardware.

(7) Because it can be built without regard to availability of long lead time, short supply components, it can be delivered well ahead of the missile on which it is based.

(8) It objectively records training performance—another factor in effective training.

(9) By assessing the proficiency of individual firing crews, it can, by lumping these assessments together, partly measure the Nation's over-all missile readiness and capabilities.

This system has yet to be fully evaluated from a training point of view. It will undoubtedly require modification in both design and use. However, the points relevant to this discussion and exemplified by this development are these: The training equipment reflects a careful analysis of the training requirement; it has been delivered on time; the necessary utilization and human factors evaluation support has been provided.

The prototype research and development and five production prototypes cost a total of one and a half million dollars. The missile costs at least this much. This is almost the only instance where a major weapons system development has had the training system integrated with the system itself and not ignored completely or appended inadequately and too late. This is a rather important note. The Naval Training Devices Center recently celebrated its 20th anniversary at Sands Point, and I am telling you now that this is the first system, first weapons system, in which we were able to integrate training and operational equipment at the same time.

Let us recap for a moment. We have pointed out the increased importance of adequate training and training equipment. Why increased? Because modern warfare is more complex and because the consequence of human failure, in lives and dollars, has increased tremendously. For example, a misfired 90 millimeter shell would cost approximately $27.00 and several lives. A misfired Redstone with a TN warhead would cost over a million dollars and possibly thousands of lives. This is in addition to the fact that the variety and extent of human skills required in the latter far exceed the former. We have demonstrated the potential contribution training equipment can make in saving time, increasing skill, saving money, and increasing safety.

It is, I believe, obvious to all of us that we need training equipment, and that we have the know-how to develop it. It is also apparent that we are not getting what we need. What question then remains? The question of how to obtain the right training system at the right cost and at the right time.

One of the better ways to get an inappropriate device at the wrong time is to send a solution rather than a problem to the Navy Training Devices Center, after the equipment system is operational. Training equipment development is a special skill, a team operation. For example, physical simulation of the whole job may not only be expensive, but ineffective. Contrary to opinion in some quarters, the best way to teach swimming is not to throw the student into the lake from a 20-foot tower and pretend to go to lunch. The complex skill of swimming, like many other skills, has many discrete elements which can best be taught separately and in circumstances only remotely similar to those in which the student may ultimately be required to perform.

How does one develop a good field commander in the Pentomic Army, or a good tank platoon leader, or a good company commander? To answer this we need to know what these people must do, how they must do it and what they must know. It is entirely possible that these jobs are quite similar, that the skill of decision-making is common to all three jobs and that it is the principal feature of each job. Further, it may be that good decision-making depends in part on rapid initial action, even if it is wrong. I say may, because this analysis has not been made. But the important point here is that the training systems developed may look nothing like the real situation; they may be abstract constructs. A training analysis system will answer this. This analysis turned into functional characteristics will yield training equipment with a good chance for success.

We can say at this point, however, without equivocation, that operational equipment is not the best source of training proficiency. There is ample evidence, both from learning theory and for practical reasons, to support this contention. This fact is especially true in military training because substantial portions of it involve providing complex perceptual motor skills. In this case, staged and spaced learning are clearly superior to unstaged and mass learning. By staged learning, we have reference to breaking a complex task up into elements, teaching them separately, and then assembling them. In spaced learning, we refer to the fact that the individual is practiced in a series of steps separated by time. This kind of training is more effective and indeed, in many cases, possible only through the use of training equipment. There are certain other obvious advantages, such as the fact that training equipment is almost always importantly cheaper than its operational counterpart; it is more rugged, safer, and more adaptable.

The training analysis procedure mentioned above is presently the exception to the rule of too little too late. We have the tools, we have the facility, we have the skilled personnel. How do we get what we know we need? The answer to this depends principally on two things: (1) submit the problem, not the solution; (2) submit it early in the game, not after the system is in operation.

What can be concluded from what has been said thus far?

Training and training development are of increasing importance: they will spell the difference between success or failure in any type of future conflict. Present training device development is inadequate: it is too little and too late. We can rectify this situation with surprising ease and with long-run economies by: considering training as an integral line of the

operating system; providing the requirement early enough; funding it adequately; avoiding solution by invention, stressing adequate analyses of the training system.

By acting immediately, force readiness can be markedly improved.

This might be a good place to stop, but I have two things that I might bring particularly to your attention.

First, I think that you can assist in improving the training device situation very considerably, by getting the requirement in early. In your position in the training activities, you have knowledge of and are aware of what your training requirements are likely to be. It is partly your responsibility to alert people as early as possible to important training areas. But perhaps even more significant than this, because of your special skills and training, you are able to assure that the requirement that comes to the Center is either fully defined in terms of the training situation, or you request that it be defined. It is impractical to duplicate the entire environment—to build a small image of the world inside of a room. Ingenious and capable as our engineers are, they still have not learned to do this. When you ask for training devices and do not state what are the critical tasks, engineers have no alternative but to decide for themselves what these tasks are. They find this, of course, impossible, and so they follow a very obvious practice: they include everything. As the project proceeds, for cost and for technological reasons, they restrict the design. You will often discover as a result, a very elaborate device so distorted by practical necessity, that it has relatively little use for training.

If time does not allow, or the situation does not permit you to provide such an analysis, you might at least put some brakes on the inventive capabilities we all have. Time and again, I am sure, in the course of training, you have conceived and invented training aids and devices. Unless you have made a thorough analysis of the job, you will discover that you were doing exactly what everybody else does, and perhaps no better.

The process of solving a training problem through training aids and devices by invention is costly. And once the requirement arrives at the Center and somebody describes the product, it is very difficult to change no matter what the future may recommend.

We find we can do a better job for you if you tell us that you have a training problem and, if possible, describe what the needs seem to be. If you are unable to detail it, we will work with you to get the facts. We do not make them up. We get them from you and other operating experts.

Let us take advantage of the fact that we know how to do a training job, that we can provide sound training aids and devices based on a considerable amount of educational psychological knowledge, and that this would make a vast improvement in our capabilities—an improvement that we are not now achieving.

Thank you very much.

CHAIRMAN VALLANCE: Thank you, Dr. Seitz, for your very excellent talk.

We have an abbreviated session this morning, you will note, because the afternoon is going to be a little crowded. Let us now retire to our Group Discussions and be back here around 10:45.

(The Conference was adjourned for Group Discussions.)

(The Conference reconvened after Group Discussions.)

CHAIRMAN VALLANCE: Shall we get on with our business?

We will hear from the representative of Group 1. Their topic was "TV As An Instructional Medium." Dr. Kanner will summarize.

Dr. Kanner.

At the present time there are an estimated 136 closed-circuit television facilities in civilian use representing an investment of about $20,000,000. Within the Army, six major installations are using television for instruction with a number of others either investigating their needs or procuring equipment. This situation contrasts with the year 1953, for example, when there were about one or two civilian television facilities and two in the Army, one at Fort Gordon, and the other at Fort Monmouth.

What has accounted for this phenomenal growth of educational television? Research findings have contributed; however, it would be flattering but inaccurate to say that research alone has accounted for this growth. The major reason for its growth especially among civilian users has been the requirement for mass training. Very simply, the increasing load of students coupled with instructor shortages have led to the use of television for teaching large groups of students. But this is not the only or important reason for using television, particularly within the Army.

Within the Army, opportunities for mass training are diminishing as the Army decreases in size and as training takes on a more specialized form. Let us look, therefore, at some of the uses being made of television within the Army. The oldest users of television are the Signal Schools at Fort Gordon and Fort Monmouth. In addition to meeting their own everyday training needs, their television facilities are used for carrying on various Signal Corps studies to develop new uses for television in training.

There are a number of ways in which the facility is used in everyday training in these installations. Mass training plays a role, and television is often used to teach combined classes at the same time or large groups in a theater employing large screen television-viewing equipment. It is also used with smaller classes to teach or demonstrate maintenance techniques involving small parts or ordinarily inaccessible equipment.

Another use for the television facility at these installations is the transmission of training and other types of films. With appropriate scheduling, a number of classes can simultaneously view a particular film on their TV receiver. Generally, this may occupy the first 10 or 15 minutes of a particular lecture or demonstration. The receiver is then turned off, and the instructor continues with his presentation. Live television may be used to replace an entire hour of instruction or to serve as an adjunct to ongoing instruction.

At the Walter Reed Army Medical Center, we have a color television facility. At times it is used for lectures, demonstrations, and so forth, to large audiences, particularly for medical and dental conventions. The major use, however, of the facility is for briefing, orienting or teaching small groups of highly-skilled personnel. An example is the use of television in conjunction with conducting surgery or an autopsy. The television camera is mounted above the operating table and students watching over a monitor can gain a clear picture of what is going on. This use of television has

eliminated the familiar amphitheatre. In general, the television facility at Walter Reed is used to teach or inform small, critical, scientific groups in a manner not feasible by other methods.

Another important use made of television within the Army has been to reduce or eliminate walking or transportation time to field exercises. With appropriate microwave equipment, such demonstrations can be transmitted from the field to a classroom or other appropriate view site. This use of television has two advantages. The first is that of eliminating trainees' marching time and the second is that of insuring that the trainees see the important or critical aspects of the demonstration.

Let us turn for a minute to two typical examples of the use of television for teaching by civilian institutions. The State University of Pennsylvania was one of the pioneer users of television, and they developed many important techniques. The major employment of the medium at this institution, however, is for mass teaching. Large introductory classes in various subjects are taught by one instructor. An interesting experiment is going on within the school system at Hagerstown, Maryland. About a year ago, because of the lack of information on the potential value of television in the public school or high school situation, the Ford Foundation cast about for a school system in which to evaluate the use of television. Hagerstown school personnel were perfectly satisfied with their school system. There was an adequate number of buildings and teachers. It was felt, therefore, that this might be a good place to put television to the test. The Hagerstown television finds its major use as an adjunct to its regular classroom instruction. A typical example, for instance, might be using the first 15 minutes or so for teaching by television. Here, an outstanding teacher would speak, or materials not ordinarily available in the classroom would be shown. Following this, the regular classroom teacher takes over and continues with the instruction.

Among the major benefits, as seen by the Hagerstown people, is the improvement in teaching skills facilitated by the regular classroom teacher's watching an effective instructor over television. In addition, the work load or preparation time of this regular teacher is reduced, giving him more time for individual instruction, answering questions, and so forth. Prior to the use of television at Hagerstown, their students scored below the national average in many college entrance examinations. The situation has since changed in a more favorable direction with the use of television for instruction in specific courses.

From these various applications we can abstract the following criteria or guide lines in determining whether television can help in your own training situation. I would first list improvements in teaching effectiveness. Particular examples would be electronics training, where small or inaccessible parts are involved or where instruction is now limited to a van permitting only two or three students at a time to see various operations. Under this category, I would also list the advantage of being able to use the best instructor to teach more trainees. A second category is mass training. If the training situation permits, combining two or more classes ordinarily receiving the same instruction and having them taught together by television is an economical instructional procedure. Third, the use of television for field exercises or demonstrations can reduce or eliminate trainee marching

or transportation time. Finally, television may be used to transmit training and other types of film to larger audiences.

In addition to these applications, users of television at individual Army installations have come up with many other findings. For example, television is being used for instructor training and has proved helpful in showing effective teaching habits. Important savings in training aids have been achieved with television. Because of its close-up advantages, actual parts or equipment can be used instead of mock-ups or training aids. Where training aids already exist, the close-up advantage of television further enhances their value. I can make only passing reference to the value of television in conjunction with prompting equipment for standardizing military instruction.

Here are some of the major questions usually asked concerning television. The first is how does it compare with other methods of teaching? There are at least 60 different studies bearing on this question and the general findings are that television can teach a variety of subject matters at least as well as conventional methods including lectures and demonstrations. The second question which came up frequently this morning was how much will television cost? While we use standard commercial equipment, particularly the Vidicon camera, there is no standard equipment package as such. Instead we survey the specific training needs of an installation and engineer the television facility to meet these needs. So the cost will vary with the training requirements of a particular installation. In one instance this cost was as low as from 50 to 60 thousand dollars, and at the other extreme another installation is using nearly a million dollars worth of television equipment. But the general average is about $100,000. Where an installation wishes to try television on a more modest scale, appropriate engineering adaptations can be made.

There is a set procedure for Army installations interested in the best use of television. AR 108-40, Television, outlines specific procedures. If you are interested in television, a request should be made to the Army Pictorial Service Division, OCSigO, for a survey. We then send a survey team to your installation. This team will brief your personnel on various uses of television and also examine any aspects of your training mission with a view to determining whether or not television can be of use. In addition, the cost estimates and personnel requirements specific to the installation's needs will be given.

In conclusion, let me state my viewpoint on the role of television in military training. It is not a cure-all for military training problems. Nor can it be considered a substitute for the hard work necessary for any type of effective instruction or a replacement for conventional instruction. It should be looked upon as a useful adjunct in meeting certain specific types of difficult training problems. The average television facility will have a capability of about 35 hours of live presentation with at least an equal number of hours of film presentation, although the latter can be increased to any size without any major increase in personnel. Most installations give thousands of hours of instruction. The problem, therefore, would be to select those critical 35 hours which can best be improved by television presentation.

CHAIRMAN VALLANCE: Are there any questions for Dr. Kanner?

MR. POE: Dr. Kanner, how is TV superior to a movie as you have described its utilization?

DR. KANNER: Let us break it down from a number of viewpoints.

From a teaching viewpoint, as far as I know, there is no evidence to indicate there is a difference. As far as I know, there is no difference between a movie and a similar TV presentation, or similar classroom presentation, covering the same material. There is no difference. The differences, if any, are of an administrative nature, and with reference to the Army, the length of time it takes to obtain a motion picture.

A MEMBER: How do you arrive at the conclusion that television is a teaching method? It appears to me to be a medium, not a method.

DR. KANNER: I feel it is a method for this reason: They look at a monitor which we use in transmitting existing classroom instructions. When it is used for transmission I would say it is a medium, but when you are using TV to improve instructions, I feel it is a method. I do not know whether this is an important distinction or not.

A MEMBER: It appears to me it is still a medium. It allows for mass education, but it also allows small-group instruction, say in critical equipment.

Penn State has had one metallurgical microscope. They used television very well to transmit to 25 or 30 metallurgical engineers certain evidence, or slides, or something.

So I think that applies in this area. To me, where it is used either for mass or small groups like that, you are entering into a situation where it is merely a transmission medium and allows you to take the skill of one person—for instance, your master teacher, who can deliver certain introductory portions of a lesson, or take certain critical equipment and make it available to larger groups of people.

CHAIRMAN VALLANCE: I think Dr. Seitz has a comment on this.

DR. SEITZ: I am impressed with the observation you made, that in order to instruct by television, you have to invest a hundred thousand dollars or more.

It has been our experience in the Navy that wherever we use large studio systems, it was just a matter of time before the utilization of the facility dried up.

For example, some years ago the Naval Academy introduced a large television system, and they planned extensive use of it. The first year they had quite a number of training specialists using television; then the following year there were less of them; the year after that there were ten of them, and last year there were two of them. We received a letter this year asking us if we would please come down and help them find out how they could use this expensive piece of equipment more effectively.

In the meantime, recognizing that television has all the advantages that we think it has in some cases, and I think that it does have some advantages, we need to find some means of using it in a minimum situation. This situation should be inexpensive and instructor-dominated, rather than part of a system in which a group of technicians and directors operate the thing as if it were a television operation in a commercial studio.

Now we did have at Bainbridge Naval Training Station some TV, a TV eye or small camera, amounting to something like $1,200 worth of equipment.

I can tell you that the Navy people in these schools in the past were not happy with the thought of television equipment. We had some people here a little while ago—I do not know if they are still here or not—who had something to do with that, and maybe they can give a direct account of this. But I know from what my people tell me that this is the first time television has had any amount of real reception and acceptability.

The training activity at Bainbridge in the area we were using this was closed up sometime back or was planning to close up—the activity was moving to the Great Lakes Naval Training Station—and it was requested that all equipment and all people working on it be transferred up there so they could continue this kind of instruction.

I would simply recommend to you that there are effective ways to use television, that it can be inexpensive, hardly any more expensive, if as much as minimum motion picture facilities, and you can reap all the benefits that we have heard talked about. Of course, there are the special problems as in the operating rooms at the National Institutes of Health but if TV is going to be of any real use for instruction purposes, it is our impression it has to be instructor-controlled and dominated, unless you expect to imitate New York University. What they are doing every morning at 6:30 is teaching classics to 120,000 people who get up that early to take English Literature, although only 187 enrolled. You do not need that kind of system.

A MEMBER: I would like to point out one thing. That $1,200 he mentioned does not include the recorder, which is the thing most people want in order to record the programs. A recorder costs anywhere from five to *$50,000, correct?*

DR. SEITZ: Obviously, if you want a tiny recorder, and if you want to have all the things Hollywood has, then you have to pay Hollywood prices.

In any instance, that is one of the very reasons for having television as against having motion pictures. One thing is the flexibility of television; you can change tomorrow because the situation changes. And, in many instances you do not want a motion picture of your whole operation; in many cases it may not be that the whole activity should be doing it.

Everybody cannot have a backyard Hollywood.

CHAIRMAN VALLANCE: I think we will have to call a halt, unless you would like to add any rejoinder to these observations.

DR. KANNER: The critical part is personnel. Wherever we have encountered difficulty in TV at an installation, we found it has been due to a lack of contact between the educational and TV people.

CHAIRMAN VALLANCE: May I volunteer your willingness to communicate with these folks if they should like to write to you?

DR. KANNER: Surely.

CHAIRMAN VALLANCE: You will find Dr. Kanner's address in the Army Pictorial Service Division in your program.

Now may we have a report from Discussion Group 2, having to do with student critiques.

Mr. Grigsby.

MR. GRIGSBY: Discussion Group 2 considered the subject, "How to Make the Most of Student Critique." I think that after about 15 minutes we realized that we were somewhat similar to the lion in the forest who went out searching for friends of his. He came upon a mouse and he shouted to

the mouse, "Who is the king of beasts?" The mouse, cowering, said, "You are, O lion." And the lion proceeded to the point where he met a monkey, and there he shouted again, "Who is the king of beasts?" The monkey said, "You are, O lion." So the lion went along until he came to an elephant, and he stood before the elephant and shouted, "Who is the king of the beasts?" The elephant said not a word, but wrapped his trunk around the lion and threw him violently against a tree. The poor little lion got up and said, "You needn't get so mad just because you don't know the right answer!"

I think that we in the panel on student critique found ourselves more or less divided into three groups. Among our people there was one who claimed to be a 20-year student, and he spoke for the students. Others of us were "connected with the educational field." Finally, there were those of us who were instructors.

In considering the problems involved in student critique we were able to break the questions down into areas: First, the critique of the student by the student. It was pointed out that this is a very valuable device in certain limited teaching areas and types of classes. The instructor training course was named as the most important area in which this kind of critique could be used. There are a number of advantages. The critique of the instructor-student by his fellows shows him the goals he can and must achieve as an instructor. He is suddenly looking at himself in a mirror, realizing and analyzing his problems. Thus, he can, from the critiques that he hears and those he himself presents, gain much valuable and helpful information.

It has, however, both for instructor training and for student use in other kinds of classes, the disadvantage of being time consuming. Very often it is invalid. Its value lies in the material it presents.

We had a very interesting discussion on the collusion that may accompany this kind of critiquing, and we decided that it has—as was mentioned in yesterday's report—limited value, and there are too few places where it can be used. However, it is a technique that has some value. It must be controlled by the instructor; it should be limited to advanced classes and to certain kinds of subject matter.

Now the second point that we discussed on the use of student critique was the critique of tests by students.

I think that the panel was pretty definite in its conclusions and recommendation on this point. The panel broke the problem down into two areas: One, the critique of tests in terms of their construction, and two, the critique of the general use of the test and re-affirmation of instruction and teaching points.

The panel, I believe, condemned the use of students to critique test construction. ("Specific test-question-construction criticism" were the words I think we finally agreed upon.) This kind of critique is of little value and suffers the point of the story that was told at the very first.

However, the panel did not condemn the use of the test critique for the purpose of review, that is, for the purpose whereby the instructor re-emphasizes principles, points of instruction that have been missed, answers not understood, and the aim of the test itself.

In our third area of consideration, the critique of the instructor by the student, there was quite a discussion. The limited value of student critiques of instructors was pointed up, but the following definite request was made by

the panel: Other techniques to determine what constitutes good instruction (for example, some kind of objective tests or objective review) must be developed in order to eliminate the grim disadvantages that accompany the present instructor critique. I think there was a caution mentioned that I should call specifically to your attention concerning interpreting the CONARC 20 per cent student evaluation requirement. The group expressed reservation about using this as an instructional evaluation device and doubted whether the instructor should even call it to the student's attention.

One very important point was made here which more or less put us all under fire. It was suggested that perhaps we, or perhaps the educational advisors contribute to the problem. It could be that some of the difficulties which arise from this student critique of instructors are engendered by the approach taken by administrators of the school, since the students are asked, "What do you find wrong with the course?" or "What do you find wrong with the instructor?" or "What do you find wrong with something else?" It was mentioned that, of course, if somebody is asked such a question and he is under the glare of the questioner, he looks around and says, "The lighting is bad," or "This or that is bad," and he has made some answer to the question. Perhaps if the questions were phrased more positively, we would not have to discuss the problem.

The last point that we considered was the critique of course content by the students. The group agreed that the critique must be objective. This is a very difficult requirement for the student who lacks the experience to make his critique objective, but if such objectivity could be developed, such a critique would be valuable. I think that the panel doubted that such objectivity exists at present in any form, or is in any student experience. If, however, a student makes a suggestion that would improve the course, the panel agreed, it should be considered and incorporated.

Those were the four areas which were discussed: the critique of the student by fellow students, the critique of the tests by the students, the critique of the instructor by students, and the critique of the course content by the students. I will be glad to answer any question on this myself, or direct any question to members of our panel.

CHAIRMAN VALLANCE: Thank you, Mr. Grigsby, for a good report.

And now we come to Group 3. Who is going to cover the report?

Dr. Andregg.

DR. ANDREGG: The first conclusion that our group came to with respect to how the instructor can make better use of classroom time, was this: That there should be less of the hot air or radiation method, and more student-doing in each unit or activity of instruction.

A second point was made early in the discussion that the student should be given reasonable assignments. These assignments might be reading assignments, or doing assignments where a product might be involved, or a problem solved, and they should be related to definite questions or problems which the instructor posed.

If we cut down on the vast amount of reading—in fact, some of it does not make sense—we certainly can give the students more direction in their out-of-class activities, and in the in-class activities, than has been done in the past. If we follow up by actually checking and evaluating the work or products in class, we have clinched the deal.

A third point: Student activity in instruction can be encouraged before class by the use of advance sheets; during class, by the use of practical exercises and field problems; and after class, by integrating the subject or the problem involved with those of other instructors who will give their instruction later in the curriculum.

The next point was that some effort should be made in advanced officer-student classes to cut down on classroom time per day and per week. As it is now, most of the schools experience a 30- or 35-hour week, and their recommendation was, in the case of officer-student classes, that we should cut down on the formal classroom instruction and make students responsible for their own learning activities out of sight of the instructor. Not so in the case of enlisted men who are provided with integrated learning experiences, where theory and practice are given during the week and large numbers of laboratories are scheduled.

Even with the 30- or 35-hour week, groups of instructors can engage in better curriculum planning, where they can cut down on the eight-hour day, or the effects of the eight-hour day in the classroom, by combining theory with practice, by pressing for continuity of instruction and spaced learning, by getting the proper sequence of instruction in guided exercises, and going from the simple to the more complex, and by integrating what they teach with what others teach during the day and during the week.

The next point involved the recommendation that we get more problem-solving activities in our instruction. Problems have many advantages in learning. First, they set up a clearly understood goal for the learning, if they are properly presented. Second, they motivate the learner if he believes them to be job-related, and if they are of appropriate difficulty for him. Third, the thoroughly trained learner thinks clearly, and problems provide for transfer of training, if the instructor points it out. And last, research has shown that the use of the problem method results in more permanent learning, and forgetting is reduced.

The group suggested that perhaps a little more coordination might be placed on the assignment of students. They made reference to the instructor courses that were discussed yesterday, where, if we knew the activity to which the student were going to be assigned, proper coordination could be made with on-the-job training at the activity by tying it in with the instruction at the school.

For example, in the instructor training courses it is known in most cases where the student, enlisted or officer student, will be assigned; he knows what his subject will be, and we can follow him up on the job with spaced problems and activities.

One or two examples were given by some of the group members. The Navy example on job assignments was certainly a good one.

Lastly, the group recommended that after all the solution depends on the instructor, and the basic lesson plans themselves, and if the instructor is given proper guidance by his supervisors, if he is allowed to use initiative and imagination and encouraged to put more practical problems involving student activities in his unit of instruction, he will turn out men who are more proficient, who can perform the job, and who will grow on the job.

Now if there are any questions, I will be glad to direct them to other members of our group, or try to get the answer somehow.

A MEMBER: Do you recommend reduction of the 30- or 35-hour week?

DR. ANDREGG: Thirty or thirty-five hours, of course, is in the directive now. We did not recommend violation of any existing directives, but certainly—and you correct me, members of the group, if I am wrong—we were of the opinion that we ought to work in our officer-student classes toward getting less formal classroom instruction per week and more practical work by the students out of class.

A MEMBER: But no change from 30 or 35?

DR. ANDREGG: No change was recommended. However, it might be desirable.

Any other questions?

A MEMBER: I am quite interested in less classroom work for officers and more outside work.

First of all, do you envisage this for all officers, from basic clear up to their advanced course in Leavenworth, and so forth, or do you limit it to certain levels of officers?

DR. ANDREGG: I believe the thought of the group was for the advanced classes.

COLONEL BAKER: At the present time, this directive is only applicable as high as Army War College work on basic lectures by distinguished individuals, and self-study by the student group. This is limited to the Commanding General's staff.

Now, as to the problem as stated by Colonel Chandler, it is not a question of getting the 35 hours changed; it is a question of getting your own instruction down to that level. The majority of you are spending more hours in the classroom—correct me if I am wrong—than should be the case.

So I think that this is the basic problem, and once you have gotten it down to this, if you are still accomplishing your results, then probably we can determine whether we should lower the 30- or 35-hour requirement.

DR. ANDREGG: I think there may be a misconception as to what an academic hour is.

COLONEL BAKER: There might be some misconception as to what an academic hour is. This does not mean you have to sit in the classroom for 35 hours. This is instruction, which I think can be very well demonstrated by the Infantry School, with which I am somewhat familiar, in that many of their lectures take place in the stands, in the fields, and during this period we go right from the stands to exercises in the field, back to the stands for 15 or 20 minutes, back out, and perform work on the ground.

This is an academic hour and it is academic instruction.

DR. ANDREGG: There is one other point that I missed here in summary, and I think it ought to be given.

The group pointed out that there was certainly a need for better written instructional materials developed at the school level, to take the place of, and supplement in some cases, technical manuals, field manuals, and so on.

These instructional materials would include lots of problems, pictorial illustrations and so on, so that they could be used by the man on the job, as well as by the school (in the school laboratory) in a practical situation.

A MEMBER: The second part of my question would be on the officer's outside work, not under the supervision of an instructor.

What are your suggestions for techniques that might be used to make this effective? In other words, how do you insure that the officer is doing the kind of work that he should be doing; that he is getting the results, the education that he should be getting, and an important part would be how do you make the research material that he would need to do outside work available, and research facilities and so on?

You can do higher level work at the War College where they have tremendous library facilities and people assisting the student, and so forth, but when you get down to the average service school, would you have the research material and facilities available for officers to do most of their work outside, and how would you control it?

DR. ANDREGG: The group thinking on that point was this, I believe. Certainly you would have some materials, and every effort would be made, through financing and so on, to get more materials. Projects and assignments would be guided by the instructor, but the advanced student would be allowed to go on his own initiative and do research in the libraries, or complete his staff study, or whatever the requirement was. Later, he would be expected to report on it; it would be carefully evaluated and critiqued, and there would be a definite follow-up.

Are there any other comments or questions?

CHAIRMAN VALLANCE: Thank you, Dr. Andregg.

Now Group 4.

DR. BALDWIN: Dr. Seitz organized his discussion around three groups of questions concerning planning for the use of training devices, with special emphasis on technical subject matter.

Most of the group's time was spent discussing problems of communication. Apparently, many of the schools do not know what kinds of devices are available; they do not know how and where to find out about them; nor are they aware of the fact that consultation services are available.

A short discussion concerned the value of training devices with respect to technical training. There was general agreement that many of these devices are quite useful, and should be part of most training programs.

Dr. Seitz was questioned about his comment, during his earlier talk, that training aid devices are, in many respects, superior for training use to the equipment which the device simulates. There were some, apparently, who interpreted Dr. Seitz's remark as implying that one should not use operational equipment for training purposes. This was not his point at all. In terms of cost and safety, however, there are times when a training device has obvious advantages. Operational equipment, for example, may be hazardous when controlled by the partially trained, and is almost always more costly to operate than a training device. Therefore, in many instances the use of a simulator of some type is quite desirable from the standpoint of safety and economy.

"When, in a training program, can a training device be used with maximum effectiveness?" was an interesting question which was asked of Dr. Seitz. His answer, in essence, was that the utility of any training aid is closely related to the stage of learning which the class has reached. As an example, in the training of student pilots, general orientation of the student

during the early stages of training is most important, and is primarily an intellectual function. Here, only the grossest type of training aid is required.

The second stage in training might be a step toward specificity. For example, the student may be taught the function of each control, and what it looks like, on a particular portion of the control panel. However, it is not necessary that the dummy control simulate the function of the real one. In this case, a complex simulator would be unnecessary, and could easily be supplanted with a very simple, inexpensive mock-up.

I think it is fair to say that the major portion of the discussion concerned communication problems. I think Dr. Seitz and Colonel Hunter were somewhat dismayed to realize that many people working in Army schools neither know who they are nor what they do nor what kind of services they can render.

For example, the U.S. Naval Training Devices Center publishes a catalogue which describes the kinds of equipment they have developed and the functions of these items of equipment. Furthermore, Colonel Hunter pointed out that CONARC will soon send to Army schools a publication which will be a guide to the use of the U.S. NTDC catalogue.

"Now that we know of the existence of U.S. NTDC, by what means can we obtain their services?" was a question which was raised. In response to this question, Colonel Hunter briefly described the relationship of the Army Participation Group to U.S. NTDC. He concluded his remarks by suggesting that the best way to obtain U.S. NTDC's services was to obtain CONARC approval. CONARC would then handle funding problems and would continue giving assistance when necessary.

In addition, U.S. NTDC has field offices located around the country, and they are available to assist you with your problems.

In addition, U.S. NTDC has people who visit various Army schools from time to time. They assist the schools in the use of available training aids, as well as in the development of new devices. It became obvious during the discussion, however, that there are many persons affiliated with the schools who are not aware of these visits. A recommendation, then, is that internal school machinery be set up to notify interested personnel that, during the period of the visit, someone is available to assist in training aid problems.

This concludes my summary. If there are questions concerning ways of procuring the services of U.S. NTDC, I suggest that they be directed either to Dr. Seitz or Colonel Hunter.

CHAIRMAN VALLANCE: I think we can spare about five minutes for questions here.

DR. SEITZ: There is one additional thing we said. That is, that a number of publications at the Center probably are sent to training aid centers and the people at the schools never see them. At least, as far as the group that we discussed this problem with was concerned, no one has seen any of these publications.

The recommendation there was that when you get back home, visit your training aids center, and if they have these publications, fine. If you decide in addition to what they have that you would like an extra one, let us know, and we will be glad to send it to you.

CHAIRMAN VALLANCE: Dr. Pickard?

DR. PICKARD: The publication the Naval Training Devices Center puts out has a reference in there which I think specifically says, if you want to negotiate a project you will cite the fund, and then as to how you will cite the fund.

You said CONARC will assist. The two are not compatible, Colonel Hunter.

COLONEL HUNTER: In reading that, you are reading a Navy document which was published about 1950. Procedures have changed in the interim considerably, and, of course, AR-315-5 is the Army bible as far as this goes, and it outlines the procedure you go through.

CONARC, of course, is responsible for the training of the Army in the field. The Center provides CONARC with the ability to assist in that training, in the training aids devices area. That being CONARC's responsibility, CONARC is also responsible to assure that the funding is taken care of, and it takes on that job. If the aid that is needed is for the Army in the field and is justified from that standpoint, CONARC gladly goes to bat for the money to produce it. And it does not come out of the school funds or anything of the sort.

Of course, if you have a local problem, something within your own school, within the training aid subcenter attached to the school, or your own abilities, and you need a little advice or something of the sort, we can certainly provide that. That funding is out of the local training aid fund that is set up for that particular purpose, and usually given to the school or to the training aids subcenter for that local purpose, but for the larger things, the big devices and the devices that have widespread interest, CONARC themselves takes care of it.

CHAIRMAN VALLANCE: Question?

A MEMBER: We put in a request on radar training from the Signal School, I believe about a year and a half ago, something like that. The design characteristics and some of what we wanted were listed on it.

The Naval Special Devices Center directed it to CONARC, and CONARC further directed it on to see whether there was interest generally within the Army.

It came back from CONARC stating that there was no interest, apparently, other than within the Signal School which originated it.

I believe the funding was turned back to the school because of lack of widespread interest, although the device itself cost around a thousand dollars.

Now, is that the way it works? If there is not widespread interest evidenced, it falls back again on the originator?

COLONEL HUNTER: That is correct.

It apparently was not a device needed by the Army in the field, but simply by the Signal Corps. The Chief Signal Officer is responsible for training his troops; he must furnish the means of training those troops. If that device was for troops under his command, he is responsible.

A MEMBER: That was not true in this case; we were training Ordnance people and Artillery people. So the fact that no other school had it—

COLONEL HUNTER: This is a nice little point that I am glad you brought up, that I took up with the group that we had, Group 4, and that is the responsibility of the schools for the Army in the field.

This poor guy that commands the Army in the field has nobody to represent him except General Wyman, and he is a pretty busy man, and he depends upon the schools who are the fountainheads of all knowledge in this particular branch, to offer service to take care of the Army, especially the technical services.

As we all know, they take care of themselves very well, but nobody takes care of the artillery, and infantry, and armor, except the schools.

Now the trouble is, the schools think first of their primary mission, which is the individual-training mission, and then about the job of training the units in the field, which is the unit-training mission. You have no responsibility for that, but they have a moral obligation to think about that, and this device probably was not drawn from that angle because it did not apply to the school itself. The school kicked the aid out, whereas it actually does belong to the Army in the field.

Now this is a very fine distinction, and you have got to remember this, and this is a good group to make this point to, because you are all responsible; you are from the schools who are responsible for the total training of the Army, and be sure that you take into account the unit commander's situation out in the field.

Maybe this does not apply to your particular problem right now. For example, FUPA—I am reminded I am not supposed to call it FUPA from here on out—but at any rate, the Redstone trainer is a unit training device. It trains the entire field artillery battalion that shoots the Redstone, and the Ordnance battalion; also the engineers.

But the total amount of training that can be accomplished on the trainer is more than that required by the Field Artillery Schools, so that this trainer is more than they need. It is, as Dr. Seitz was telling about the steps in the training, a trainer for the unit in the field and beyond the school's responsibility. Well, it is conceivable that if the school had been the sole evaluator of that device, that it would have been washed down the drain. Luckily, ABMA was in the picture, and they evaluated it from the standpoint of the unit in the field, and found it well within the requirements.

Now I would like to make this point to you all, that while you do have this school job, this individual-training job, you also have the responsibility for looking out for the Army out in the field, and do not forget that, and maybe if that is resubmitted along that line, it might get better treatment.

CHAIRMAN VALLANCE: Time for one more short question.

A MEMBER: There is one statement I would like to make for the record. These devices, especially the complicated ones, that are put into the field, are also installed and supported by field offices we have throughout the country. They do not just develop them and dump them in the field. We support them as far as technicians go and see they are properly installed.

CHAIRMAN VALLANCE: I think it is time we go out for lunch. We will meet back here this afternoon.

(The Conference was recessed.)

SIXTH GENERAL SESSION

Thursday, 30 January 1958

Improving Instruction Through Effective Administration

CHAIRMAN VALLANCE: I think we should get underway again, at the risk of depriving some of the extended coffee drinkers of the first few minutes of the afternoon's presentation.

We have come to the point where we are not talking about teachers and contents, but the man who is in charge of how the teacher operates, the administrator of the school.

Our topic is "Opportunities for the administrator to maximize training effectiveness." To speak to us before we go into our discussion groups, we have a man who has long been in the Army school system (I don't know just how many years it is, but it dates back into World War II), and a man who has played quite a part in the development of the Armor School.

And without more to say, I will give you Mr. Henry C. Porter.

MR. PORTER: Thank you.

Introduction. The Dictionary of Education defines educational administration as, "the direction, control, and management of all matters pertaining to school affairs." This definition is entirely too broad for our purposes here this afternoon, and I think we can limit our attention to those specific aspects of administration which deal directly with the instructional situation. We will not consider any of the management aspects which deal with the organization and operation of the school. I personally am glad to make that limitation—the absence of management problems is one thing I like about working in the Army service schools. As a civilian school administrator, I attended a few school management meetings, and we became so involved with hot lunches and bus transportation that at times I wasn't sure whether I was at a meeting of the Greyhound-Pickwick Co., as it was known in those days, or at a meeting of the Thompson Restaurant chain. We are indeed fortunate, working in the military service schools, in that we have experienced, competent officers who handle such management problems for us. They do an outstanding job, both in and out of the school, and that phase of service school administration makes me very happy.

We will devote our attention, then, to those aspects of administration which deal directly with instruction. We will consider the administrator as the commandant, or the director of instruction, or an officer in one of the departments, sections, or phases of a school, who is concerned with the direction and control of instructional matters. I think that such a definition would fit the administrators of all the schools we have represented here.

We will approach administration from this standpoint: A school is organized so that it can be administered, and a school is administered so that its program of studies can be taught. Therein lies the true measure of the effectiveness of our administration: How well does it support instruction?

Supervision. I believe that the administrator can make his most substantial contribution to the effectiveness of instruction in his school, his department, or his phase, by the establishment of an active supervisory program. In our service schools today, with their relatively rapid turnover of personnel and frequent revision of subject matter, supervision is a must. But supervision must rise above the plane of ordinary inspection, and it must take on a broader meaning to the administrator and to the instructor, a meaning which will be conducive to the creation of an environment in which all members of the staff and faculty will grow. To learn such a meaning of supervision requires a little training because it isn't a meaning which is commonly held. Supervision must become synonymous with improvement of instruction.

A few characteristics of this supervisory program: First, a supervisory program in a school must be planned. You can't make supervision effective in a school, in my opinion, by a statement of a mission. You must implement the program by detailed planning; you must set forth procedures; you must state how the work is to be done. You must include all aspects of supervision: the instructor training program, the in-service training of members of the staff and faculty, the monitoring of instructors. The boarding of units of instruction and rehearsals all must be set forth in definite procedures.

A supervisory program must be continuous. It is my opinion that an administrator should have some supervisory duties which he performs every day. In these times when the administrator of a school has so many duties demanding his attention and his time, he is inclined to look for areas where he can relax a little. Supervision, in my opinion, is not one of these areas. The school administrator must not become too busy to give direction to the efforts of his instructors.

A supervisory program must be recognized by the instructors. This is difficult. It is hard to go into a classroom, rate the instructor, give suggestions as to how he can improve his instruction, and then go out a loved man. But when you come into contact with instructors who are dedicated to their work, your supervisory efforts are appreciated. I have met many instructors, both in civilian schools and in military schools, who complain of the laissez-faire attitude of their supervisors. These instructors want to do a job of teaching, and they want to do the job better. If you can convince your people that your program is designed to help them and that your sole purpose in making suggestions for improvement is to improve the operation of the whole school, you will get a program that is recognized.

It has long been the practice in our Army service schools that units have been boarded for subject-matter content and rehearsed for instructional proficiency prior to their presentation. I might add here that I came into the Army after having had about ten years of civilian school experience, and to me the boarding and rehearsing process seemed laborious and tedious. Now, after a number of years in contact with that process, both when it was being rigidly enforced and when perhaps a little laxity prevailed, I have come to the conclusion that the "Army way" is about the best supervisory practice we can have in schools. And I think our supervisory system should include definite procedures for the accomplishment of these things.

I think your supervisory program must give some attention to subject content and methods. I have a personal opinion that some of our supervisory programs put too much emphasis upon instructional techniques and so-called platform mannerisms, and overlook broader concepts of education.

I think good instruction depends upon three things, and they must be in balance. One, of course, is the instructor. If you have an instructor, such as General Newton described yesterday, who has sincerity of purpose, enthusiasm in his efforts, and a thorough knowledge of his subject, you have one of the prerequisites of good instruction.

You must have, in addition to that, subject matter which is adequate and appropriate, and a method of instruction which is effective. These three must be in balance. I have observed the effectiveness of certain units of instruction rise and decline as instructors of different abilities presented them. I have observed some units of instruction which seemed to be carried along by the personality of the instructor when careful analysis revealed that they had very little justification in the curriculum. I have seen such units of instruction, the effectiveness of which rose and fell, depending upon the ability of the instructor presenting it.

I think that administrators must so design their methods of instruction, and so choose the content of their courses, that those methods, with that content—with just the average instructor, the type we can get and train—can produce the desired learning outcomes. I do not feel that the administration of the school can safely base its program upon the necessity for outstanding instructors. If our methods are appropriate, we will continually improve our instruction. We should be teaching subjects better today than we have taught at any time in our history, shouldn't we? Because every change should be a change to a method which would improve instruction.

Supervision must concentrate upon methods so that the school can take the average man and train him as an instructor. We can take the average man who is assigned to us and make a good instructor out of him, if we approach our task in this way. I have always held the belief that we can train an instructor. There is no difference between General Newton's statement and mine on that. We can train the average officer, the average noncommissioned officer, the average technician, to do a good job of instruction if our methods are correct.

One of the most important phases of a school's supervisory program is the provision which is made for the in-service training of the staff and faculty. Several techniques have proved effective in our schools. One, which I recommend highly, is the annual instructors' conference. This usually takes the form of a six- to eight-hour refresher course in methods

of instruction. The presentations are based upon the problems which have been encountered in the school during the year. Thus a unit on examination improvement might be presented in order to improve weaknesses in the school's testing program. Newly developed training aids might be demonstrated and new administrative procedures might be explained. The subject matter for such conferences should always be pertinent and should never be repeated the following year. Instructors find this training to be most stimulating and the results obtained have been very encouraging. If you do not use this technique in your school now you might find that it would serve you well.

Another technique which I have observed in several schools is the use of an instructional bulletin published at regular intervals and distributed to all instructors. This publication is not used necessarily to disseminate policy, but for the greater improvement of teaching techniques. Topics such as, "How to use Black Light Techniques," "The value of class participation," "The care and maintenance of training aids," are typical of the subjects which might be covered in such a bulletin.

Another in-service training technique is the formation of small group seminars for specialized groups within the staff and faculty. These can be organized as study groups and emphasis can be placed upon specific school problems. Thus, one group might study the improvement of examinations within a school; another group might discuss problems related to the scheduling of instruction. The success of any of these in-service improvement devices is dependent upon the leadership and the guidance of the administration of the school.

Programming of Instruction. Another major area in which administration can contribute to the school's effectiveness is the programming of instruction. In this area the preparation of the curricula and the scheduling of instruction are included. In the second general session of this conference you considered some of the basic principles which govern the determination of instructional goals and the establishment of the school courses. I would like to discuss how the administrator can contribute toward a program of instruction which will implement some of those principles.

The school's administration should provide for continuous curriculum development. Programs of instruction should be under constant study, and provisions should be made for revision which will immediately reflect better methods and changes in doctrine. Annual revision of programs of instruction may not be required, but there should be a formal re-evaluation of each course at least annually.

The procedures for preparation and revision of programs of instruction should encourage maximum co-operative effort by both instructors and administrators. Instructors should receive an orientation on how programs of instruction are prepared and how, through their suggestions, they can contribute to the improvement of the courses they teach.

One effective way to encourage application of the concepts discussed on the first day of this conference is to require that phase and departmental objectives be written and used as basic guides in the preparation of programs of instruction. We have carried this one step farther and require that the teaching points or the learning outcomes for each unit of instruction be listed on one page as the first item in the vault file. We find that this

improves the analysis of the subject matter, encourages a more logical presentation, and contributes to the construction of valid examinations.

The school's administration cannot leave the scheduling of instruction to chance. Although in most cases the best sequence of units of instruction is obvious because of the content; there are other situations where the sequence must be studied carefully. The administrator must be alert to whether or not he has achieved the best scheduling of his program.

The opportunities for concurrent training in our school programs are rarely exploited to the utmost. Time-consuming activities, such as range work and practical exercises where one student is engaged while several others wait, should be reviewed carefully to determine how appropriate concurrent training activities can be incorporated in the school program.

The integration of subjects, considered in detail by one of your discussion groups, is another programming area where we can improve. Many of our Common Subjects requirements could be appropriately met through integrating these subjects into other instruction. CONARC encourages this method of handling. We must think of instruction in terms of how it will be applied and put these various subjects into perspective. We are too prone to present an hour of this and an hour of that. By integrating the same material into case methods, projects, and practical exercises, we could achieve a more unified, realistic learning situation. The administrator, however, must provide the guidance; individual instructors often do not see the requirement and do not think in such broad terms.

Student Orientation and Counseling. Because of the nature of our service school courses, it is most difficult to maintain close instructor-student relationships or to provide individual guidance for the student. To compensate for these deficiencies, the administration of a school must provide a student orientation and counseling program.

Most of these programs are designed to give assistance to the student and encourage him to devote his maximum effort to the course he is attending. They usually include orientation-type instruction pertaining to study techniques common to the course, a familiarization with the general nature of the course, and an explanation of the problems which may be encountered. Such programs also provide for a faculty-advisor system whereby students have specific members of the staff and faculty assigned as their individual advisors.

This system produces outstanding results when it is actively encouraged by administration. Time must be set aside on the first day of the course, during which the students meet the instructors who will serve as their advisors. Relationship must be on a more positive basis than, "Come to see me if I can help you."

In this faculty-advisor system there should be provision for the student to meet with his faculty-advisor and be counseled before trouble arises. If the student encounters difficulty, procedures should be so established that the faculty-advisor is brought into the picture. For example, if a student is brought before the faculty board, his advisor should also be present; if a student fails an examination, his advisor should be notified. These procedures are meant to encourage a close relationship between the student and his faculty-advisor. I would like to emphasize at this point the necessity of the advisor knowing his student. Here is one place where the results of our

inventory and classification-type tests can serve their most useful purpose. I knew of one advisor who continually admonished his group to rank in the top third of the class with no regard to their abilities. When he realized the relationship between ability and performance, his counsel became more realistic.

Learning is more effective when the student is frequently made aware of his progress. The student should be notified as soon as possible of the results of the examinations which he takes. He should also be apprised of his class standing several times during a course. At the conclusion of a course, he should be given his grade and his standing. With proper instruction, this knowledge can be made to serve a very useful purpose and there need be no fear of overemphasis on grades.

There should be some provision made for interviews of students who have encountered difficulty in their courses. Students who make failing scores on examinations should be interviewed by branch chiefs. Two things are accomplished by such interviews; first, the student is counseled on his study techniques and, second, the instructional department often learns how better to meet the student's problems.

Evaluation. One of the most important areas of administrative responsibility is that of evaluating the effectiveness of the management and supervisory procedures in terms of the over-all objectives of the school. This evaluation is continuous and takes many forms. This conference has already considered several of the techniques used in this area. I should like to mention two other means of evaluation which are used in our schools. They are the end-of-course questionnaire and the postgraduate questionnaire Both of these can supply valuable information for use in improvement of instruction.

In using the end-of-course student-critique sheet, care must be exercised to ensure that overemphasis is not given to the program. Student comments may indicate problem areas; but they represent only one means of determining effectiveness of instruction. The CONARC Policies Letter directs a sound approach to use of these questionnaires; to go beyond these requirements may give them more importance than they merit.

The postgraduate questionnaire can serve as a most effective means of evaluating the various courses presented by a school. Comments of the graduate who is on the job should provide valid guidance for revision of programs of instruction. These questionnaires should come into wider use and provide more data as a result of recent CONARC directives.

Policies and Procedures. One of the most important services which an administrator can perform for his instructors is to provide them with a clear statement of the policies and procedures governing the school's operations. This is especially important in our Army school system where personnel, both instructors and administrators, come and go, thereby presenting constant re-training and re-orientation problems. Such a statement of policies and procedures is the first prerequisite of effective and efficient administration.

When newly assigned personnel find a clear statement of policies and procedures available in the form of standing operating procedures, an operations guide, or simply as administrative instructions, guide lines are clear and understandable. When such a statement is not available, school

operations often become dependent upon personal interpretations and individual judgments based upon the day-by-day exigencies with a resultant loss of efficiency.

The SOP for a school should be continuous. It should provide a thread of continuity when officers charged with administration change. It has been my observation that drastic changes in a school's operations usually occur when an administrator discovers that problems seem to exist in a policy void—that procedures are not established. When these policies and procedures exist in a well-written SOP, they may be revised when the administration changes, but it is more likely that they will be reinforced and strengthened. There will be a tendency for each new administrator to contribute to the existing policy. The school will consolidate and maintain the advances which are made from year to year. A well-designed statement of policy, an SOP, is the only way I know to obtain a positive, logical, constructive, and progressive continuity in a school's program, and that includes the hiring of civilians for continuity of program. I think a well-written SOP, a sort of constitution for the school, will provide better continuity than any other thing I know of.

The school's SOP should be authoritative, it should not be circumvented by other means so that policy is found in different sources. Procedural and policy changes are, of course, made in various ways. They may be disseminated at staff meetings, by disposition forms, by memoranda, or by letters of instruction. If, however, administration is to remain at maximum effectiveness, these changes should be quickly reflected in the school's principal statement of policy.

Summary: We have considered a few of the specific areas in which the administrator can make the instruction in his school more effective. I think it is important in closing for us to recognize that administration in a school justifies itself by the service which it performs for instruction. Administration must not become an end in itself. We must avoid the conditions which are rather humorously described in Doctor Parkinson's best seller, Parkinson's Law, in which administration seemed to grow even though the functions performed decline. We cannot have effective training in a school situation without the guidance, control, and management provided by administration. We must strive to keep that administration ever aware of the purpose which it serves.

Thank you.

CHAIRMAN VALLANCE: We have time for a couple of questions.

A MEMBER: I believe General Newton said yesterday that instructors are born, not educated, in the instructor field, and I believe Mr. Porter has just said the opposite.

Now I don't want to start an argument, but isn't there —

GENERAL NEWTON: May I answer that?

MR. PORTER: Just a minute, General.

One reason, I think, that General Newton kept me on his staff, was that I differed with him.

Okay, General, go ahead now.

GENERAL NEWTON: What I said yesterday was that leaders are born. Now I also said that men are born with certain degrees of enthusiasm and initiative. I did not make the statement yesterday that instructors are born.

A MEMBER: All right, sir.

CHAIRMAN VALLANCE: Let me again suggest that we break up for our discussion groups and reconvene here at 3:00 o'clock.

(The Conference adjourned for Group Discussions.)

(The Conference reconvened after Group Discussions.)

CHAIRMAN VALLANCE: Without further ado, we will start in with our group reports, starting—I will start with Group 1; that will be a novelty.

Are you going to speak for Group 1, Dr. Hoehn?

DR. HOEHN: Yes, I am.

The topic discussed was, "Planning Administrative Records for Maximum Usefulness in Analysis and Quality Control."

The term "quality control" was defined, and related to its usage in engineering production; that is, consideration was given to the engineering analogy to determine its utility in relation to analysis and to the identification of problems that might exist in a school system.

We have on the one hand the input, or raw material, which in a school is the student coming into the school; and we have the school itself, which is a very complex production system having many interacting components. The student is fed through the production system or school, becomes processed, and is, on graduation, the output.

It was felt that we need information about the input in order to adjust the school to the characteristics of the input, and, where necessary, to determine required changes in the input.

We need to have information about the output. What is the percentage of rejects (to carry it back to the engineering analogy): Is it getting too high? What are the defects or deficiencies in the graduates?

And then, of course, we need not only to know these things, but also, if there are deficiencies or defects, we need to know from whence they came in the school program.

And so we need to tap into the school at various points and ensure that information feeds back more or less automatically to the administrators and advisors to provide a basis for continuous assessment and diagnosis.

What is it that should be evaluated or analyzed? What kind of information on what kinds of topics? There were two different organizations or statements of what we need to have information on.

One of these statements, deriving from Mr. Kneisel's outline, was something like this: We need to have information about (1) instructor, (2) the curriculum—its content and methods of presentation, and (3) the student.

Another member of the group stated that he requires information about (1) the input, (2) the course, (3) the guidance and personnel system, and (4) information from proficiency tests. The first of these is the input, the student; the last of these, the test of the output or new graduate, and the other two areas concern the operation of the school itself.

At this point it was suggested that in order to have an efficient method of analysis and quality control, we need improved methods of data processing. In particular, the problem of the speed of processing was felt to be very important. Information is acquired in huge quantities and has to be reduced into meaningful terms before it can be put to use. It is essential that this information be processed rapidly so that the decisions for action can be made in sufficient time. It was felt that IBM equipment might be useful in this process. It was stated that, except for research purposes or use on unscheduled time, there is difficulty in obtaining access to such equipment in many schools.

Some members of the group felt that our problems are not so much in ensuring that we are meeting the POI, but rather ensuring there is an adequate POI-job link; that is, a major difficulty is to ensure that what is in the POI is tied to the requirements of the job. To return once more to the engineering analogy, this gets into the matter of customer satisfaction. In discussions of quality control in industry, the term customer satisfaction is frequently mentioned; generally there will be customer satisfaction in the Army when the men coming out of school are men who have developed some, if not all, of the capabilities for doing a job. It was felt this link may be weak in many cases and that this is an area to which we must give further attention.

One answer to this problem which is being used to some degree, is that of querying students and CO's following graduation. However, it was felt this in itself is not sufficient. The problem seems especially severe in the courses where the outcomes are not easily measured, for example, general knowledge courses—courses designed to give men a head-start, but not to produce men with the complex skills which they would actually require on the job. Even here, it was felt that we can do something to improve the evaluation (the analysis and quality control) of the output of our schools by trying to define very specifically the school objectives, even if we cannot at all times tie them directly to the requirements for performance in the job setting.

It was pointed out that proficiency testers currently obtain their information on job requirements from the schools. They then make their tests and take them back to the school and administer them, instead of going out to the job situation to get information about the nature of the job and its performance requirements there. They are, you might say, working wholly within the school system itself, without consideration for the necessary school and field link. This situation is not universal, but it was felt that this method of developing proficiency measures is sufficiently prevalent as to require serious attention.

In terms of recommendations, it was felt, first of all, that there is a need for more information from the job situation, so that we can evaluate the output, the graduate, in a more realistic fashion and thus better ensure customer satisfaction.

Secondly, there should be an improved dissemination of available research on such topics as job activity analysis and proficiency measurement.

Third, careful attention should be given to the organizational units which handle the administrative records and accomplish their analysis.

Much can be said for a central control and a periodic review of the analysis and quality control techniques and forms to ensure cumulative improvement and adjustment to changes in needs and in school programs.

Next, methods to speed up the processing of information, to increase the meaningfulness of the statistics which we crank out of all these data, are areas which need attention.

Finally, it was suggested that we should do some work on sampling techniques in the analysis and quality control process. Techniques might be worked out whereby it would not be necessary to obtain information on all the people from all points in the school system, but which would enable us to reduce the amounts of data to be processed and thus obtain more rapid processing.

I would welcome any comments from members of the group on this report, either amendments or changes in what I have reported, or any additions which they wish to make.

CHAIRMAN VALLANCE: Any questions or amendments? If not, we will move on to Group No. 2.

Dr. Karcher?

DR. KARCHER: Our topic was "Making the Best Use of Aptitude Test Information." As you can see, nobody in the group was willing to volunteer for the task of reporting, but there was plenty of volunteering of interesting ideas and controversial points to be discussed. All in all, it was a very interesting session.

It was pointed out in the very beginning that aptitude tests relate to the Army's over-all problem of manpower, and really, the larger aspects of manpower. As a result, unlike many items that have been discussed here at the conference where there is a certain amount of freedom for each school to interpret directives, or where each school is in a position to develop its own techniques and interpretations, the problem of manpower allocation among all the service schools is necessarily an activity which must be dictated at the D/A level.

We discussed the fact that aptitude testing is very different today from the method used during World War II when the Army General Classification Test, a test of general mental ability, was used as the only real screening device. Thus, during WW II a few MOS's which had a high priority really screened off the cream of the enlisted input and by and large, the remaining MOS's got the poor quality that was left.

Today men are tested on the basis of a number of different abilities which are important to a large variety of different Army jobs.

It has been established by research that each one of these abilities, represented by a test in the Army Classification Battery, is valid for predicting course success and job success in a particular occupational grouping. Utilizing these various tests, we have developed what we call differential classifications, in which we are interested not only in the level of ability of a man on a particular test, but in that particular ability in which he is best. The attempt is always made to assign men on the basis of their best ability.

I think you will be able to jump to the next conclusion, that if all men in the Army are all assigned on the basis of the ability they are best in, the Army will have made a maximum utilization of the total abilities available to it.

It was pointed out, however, from the point of view in the schools, there is many a slip 'twixt the cup and the lip. Assignments do not always work out as they are described theoretically. One reason is that input availability and requirements must be continually balanced one against the other. We might have a requirement for, say, 15 per cent of the men to be assigned to motor maintenance and we may find that only 10 per cent of the input to the Army can be described as having their best ability in this area. Consequently there would be an inequity which must be balanced and must be adjusted. This, of course, causes a certain amount of slippage.

Then there are D/A policies which have nothing to do with the validity of tests or research, and of course some of the policies are overriding. A critical unit might have to be filled at a particular moment and may drain off some of the talent.

There is another area which the group discussed as a really large problem. That is the problem of enlistment commitments, and the fact that so many men enter the Army without qualification for the course training for which they have been committed. The answer to this problem transcends the research of the Personnel Research Branch. It actually involves Congress and the whole problem of recruiting from civilian life.

There are attempts now underway to solve this problem and to ensure that the enlistment commitments in the future will meet the requirements. However, you can not expect to see this solved within the next few weeks.

It was also pointed out—and I believe some people wanted it made a matter of record—that, if the Army does need certain skills in greater quantities or maybe at a higher level of ability than we are getting at present, there should be increased effort to obtain them from the civilian population. They are probably available in the civilian population; why are we not able to attract them? Again, of course, the group recognized that this is a problem with Congressional impact and far beyond our ability to do anything about at the moment.

It was pointed out—came out in the discussion that we have had occasions in the course of research to observe that final course grades sometimes do not correlate as well with job performance as aptitude tests do. Now this is a situation that does not necessarily occur very frequently, but it has happened, and there are numerous hypotheses that could be established to explain it. It involves matters of motivation and the various types of job assignments that are secured after the training, and there were a variety of hypotheses proposed to explain such an occurrence.

The research which has been collected to validate tests is not designed to evaluate final course grades. Therefore, such findings should be looked on as nothing more than tentative.

Research does have a partial answer to points brought up with Group 1 on the continual evaluation of these tests and aptitude areas against both school and on-the-job criteria. In almost every case where we can obtain information concerning job performance, we do so. The usual limiting factor is the problem of too few individuals in a particular MOS to secure a large enough sample for analysis.

There were four points made that were more or less in the line of recommendations, and I will state them briefly.

One was a feeling that this whole problem of input, the problem of attrition, and the continual letters, say from CONARC, asking that attrition be explained and so forth, might well be handled on a more centralized basis with a more unified approach. Some organization perhaps should be designated to make a continual evaluation of the over-all problem, that is, the quality of the input versus the level of difficulty of course training versus attrition, and so forth. This would eliminate the multitude of diverse directives and orders coming out which, I guess, harass you people with what appear to be quite inconsistent demands—for example, being asked to accept a lower quality of input and simultaneously to reduce attrition.

The next point brought up was consideration of secondary screening. The aptitude areas are about as fine a screening as the present art of testing will permit for enlisted input to the Army at reception stations. But there is perhaps an area for consideration of a further breakdown of the abilities—taking all those individuals who score high, let's say in the electronics area, and who are employed on an electronics-type job, and maybe giving them one, two, or three more tests to further screen them for more specific course assignment.

This is a problem which would have to be solved for the future, and I want to point out that sound research would have to determine whether anything profitable really could be gained by this approach.

The third point was a request for greater exchange of facts and a more informal interchange of ideas as related to this whole problem. We in the Personnel Research Branch are certainly interested in doing that, and we offer our facilities and assistance. We are interested in exchanging the information we have that relates to input in the aptitude areas and test scores of the men. I would like to add a further point of mine. I suggest that you investigate the tests in relation to your course grades to the fullest extent, run all the studies you can think of, and try to make maximum utilization of test scores and analysis; but before you summarize this information and implement it with a recommendation and send it through channels (ultimately to go through the Chief of the Branch or maybe, DCSOPS, CONARC, finally DCSPER, and then to us), before you go that far why not get in touch with us and have us work with you for a short time on the data. Let us look over your data, the kind of analysis you have made, and what you think the information shows. It will generally prevent a great many problems. It is pretty hard, since the manpower is already divided up before it gets to your schools, to be able to know just what your findings mean in relation to the whole Army manpower problem. We have no axe to grind. We may even be able to give you the kind of interpretation you were looking for, or substantiate your recommendation. Up to this time, however, most studies have turned out to be rather ill-founded.

It seems that you have had quite a large group of enlisted men come to schools without aptitude test scores on their Form 20's. This I don't quite understand, nor did the DCSPER representatives at the group session.

If they are EM who have been in the service for a long time, it is understandable, but we do not understand how you can be getting large blocks of these individuals without test scores, and the DCSPER representatives requested that you communicate with them. Write to them and let them know where this happens, citing time, place, circumstances, and how many people are involved. They would like to track this problem down.

CHAIRMAN VALLANCE: Thank you, Dr. Karcher.

I am sure the Personnel Research Branch of the AGO would be glad to receive any information which you can develop so well at your own schools. Now let's turn to Group 3.

Dr. McClelland.

DR. McCLELLAND: Our topic, "Improving Communications Between Schools and Departments," had as its first item of discussion USCONARC directives and D/A publications on training. Almost at the outset of this discussion, we learned that the 1954 CONARC letter (with supplements and changes) on policies and administrative instructions is currently under revision. The revision is sufficiently extensive to represent a major project on CONARC's part. Barring the receipt of new, more urgent requirements, a revision of this letter should be in the field soon. I think that is as far as I dare go in reporting a completion date, is it not?

COL. BAKER: Just about.

DR. McCLELLAND: An important basic question brought up in the discussion of policy and doctrine had to do with the amount of guidance offered. How much detail should there be?

The group agreed that the D/A and CONARC policy to furnish only broad guidance to commanders is a good one; it allows individual commanders to prepare mission details and implementation thereof as required, within the framework of the very broad policy.

It was pointed out that a conflict in interpretation on some specific administrative policy may occur when a point is covered in a variety of sources. Supposedly, the revision of the P&A letter will take care of this problem in the future.

One point we discussed on the subject of doctrine, apart from directives, had to do with the unfortunate lag experienced by the schools in the receipt of information on new doctrines. It was widely agreed such a lag existed and that it could have undesirable effects upon training.

It was recognized that the schools themselves have a mission here in preparing doctrines in their own specific areas. The further observation was made that we might as well accept the fact that for some time in the future we are not going to get as clear-cut and distinct a doctrine as we may have had in the past.

The exchange of information on doctrines and policies, within and between all levels, was heartily encouraged by all members of the group. This can be accomplished in a number of different ways: some kind of annual instructor conference, as is currently the practice in many service schools; visits, informal and formal, from school to school; and direct communications. As an aside—but an important aside—it was pointed out that matters of communications on doctrines and policies are extremely important in instances where a new school has been established.

The second general topic for discussion had to do with "Policy Guides on Training Within Schools."

It was noted there are a variety of ways, some of which were outlined for us by Mr. Porter in his keynote address earlier this afternoon: memoranda of various sorts; standing operating procedures; handbooks; conferences; committee actions; formal instructor training procedures; and others.

There was some discussion of the form in which a standard-procedures book might appear, and examples were given from one prepared at the Southeastern Signal School. By and large, procedures for guiding within-school policies would both emphasize the purpose of the document and present a fairly detailed step-by-step procedure of particular operations. In instances where a school performs recurrent functions, it is highly desirable to specify them in some standard form.

The question was raised as to how much guidance (or how much detail) should be given at the school level to the departments within the school. By and large it appeared that the same broad guidance policy which D/A and CONARC espouse is a reasonable one. Perhaps greater emphasis must be placed on detailed instructions in those instances where it is important for coordination to be effected among departments for logistic or other purposes. There appeared to be agreement on the principle that departments should be given as much flexibility as possible.

It was pointed out, incidentally, that SOP's should not be bulky in size. If it is necessary to make extensive reference, it is better to refer to a particular document or text, rather than have the detailed materials contained in the SOP's themselves. If necessary, a separate text or manual might be prepared to support detailed procedures.

Our third topic was "Interchange of Instructional Materials." It was noted that there is an established procedure, the one specified in the CONARC P&A letter, which seems to be effective. As to exchange with other service schools, it was observed that there is a liaison officer representing the Army at most of these schools, and they can arrange such an exchange.

A request was made by one representative, who apparently has been approached for materials in the past, that such requests should be as specific as possible. The amount of material that might otherwise have to be sent can be quite formidable.

On the fourth topic, "Interchange of Ideas on Educational Practices," there was general agreement that some medium for a continuing interchange was desirable. Meetings certainly should be held in the future, perhaps annually. The School Branch, G-3, CONARC is currently considering a working conference, probably to include directors of instruction and educational advisors, as an annual CONARC event. Perhaps school commandants would attend the final sessions of such a conference. No recommendation, however, has been made at this time to the Commanding General.

In summary, I would say there were five principles, not recommendations, which appeared generally conducive to improved communications between schools and departments: First, guidance from D/A and CONARC should be of a broad policy; it should not be detailed. Secondly, procedures do exist for the exchange of ideas, specifically on doctrine. All personnel involved should be encouraged to utilize them. Thirdly, procedures exist for facilitating the interchange of instructional materials. They can be used to advantage. A fourth principle has to do with the kind of instructions given by the school to the departments. In general, it was believed that, if possible, these should be restricted to policy. The fifth point had to do with the desirability of continuing some sort of working conference of this sort as a more or less annual arrangement.

Any questions?

CHAIRMAN VALLANCE: Thank you, again. And now for Group 4. Mr. Heyl.

MR. HEYL: "Relating Grades and Elimination in Different Schools to Quality of Input" was the topic of our discussion group. Our Discussion Leader was Mr. William Helme of the Personnel Research Branch.

We spent most of our time on the last phrase of the title, "quality of input," and related that to selection and assignment procedures. I might say, by way of background, Mr. Helme presented what he feels to be two major problems in the area of personnel, and personnel selection and assignment procedures.

First, personnel selection is not quite an accurate term, since in the Army situation the personnel are already selected, since there is a very limited hiring and firing privilege, and since there is no excess of manpower which can be drawn on to fill the jobs that need to be filled. So that personnel selection is really more nearly an allocation of the pool of manpower already on hand to a set of jobs which need to be filled.

He recognized, of course, that there is some latitude in making the assignments to fill these jobs. He mentioned the developments of the present classification system, starting out with the AGCT a number of years ago. At that time, since that was the only test available, it was possible to assign only 50 per cent of the men to all jobs who were above average in their aptitude scores.

As the test battery developed and differential aptitude tests were introduced, an increase was possible so that then it was possible to supply 67 per cent of assignments to jobs in which men's test scores were above the average.

With the present ACB, which was adopted in 1955, I believe, and in conjunction with the new MOS system adopted about the same time, it is now possible to assign 75 per cent of men to jobs in which their aptitude scores are above the average.

We discussed at some length the problem that results when one test score applies to more than one area, and some specifics were pointed out in terms of how priorities are established, who gets the top men, and a number of other factors, all of which tend to have a limiting effect on the preciseness with which men can be assigned in terms of their best aptitude scores. He summarized this section of his presentation by saying that the efficiency of any differential selection system depends on two primary factors. One, the effectiveness of the individual instrument for selecting personnel for a given area, and two, the lack of relatedness between the various measures in the battery of differential tests.

Later on in the discussion it was brought out that as we improve the instruments, as we are able to define more precisely and perhaps take what is now one test and develop either two new tests or one new test to supplement the present one, we may be able to get finer differentiation in our assignments.

The second major problem he pointed out was that of the evaluation of selection devices, and I think here it would be enough to say that a bit of caution is necessary in interpreting the results of test evaluation in relation

to the sample on which those tests are being evaluated. That is to say, if a test in a given aptitude area has already been administered to people in the Army at large, and those people have then been assigned to a school in accordance with the scores on the first administration; when a later sample is drawn from a particular school and tested with a revised version or a new version of a test for that aptitude area for test evaluation purposes, consideration must be given to the fact that these people have already been screened once on this particular characteristic. We might expect a lack of, or a lower degree of relationship between the aptitude being considered and the test being evaluated. If a correction factor is used, and this can be done, then we obtain a better valuation of the revised instrument.

There were a number of questions raised during the discussion. One: is the ACB now used in selecting men on entrance to the Army? The answer was given: No, it is not. The AFQT is the screening device used on entry at the present time. However, it was brought out that in connection with the release program for low aptitude men, the ACB data are taken into account in specific situations.

The possibility was mentioned that it might be well, or it could be considered as a possibility, to move the use of ACB back earlier in time in relation to a man's induction into the Army, and perhaps use the ACB as a selection device on first go-round. Mr. Helme brought out that there has been some discussion of this, that it is in the mill; but its present status was not brought out.

Dr. Karcher mentioned the problem of what can be done with men who are committed to a given branch or a given type of job in the Army, when it is found that having been so committed, they do not have the aptitude for that job. He said that there was nothing that the selection people could then do. This was corroborated in our discussion. The reason that I repeat it here is that it was brought out by a number of the people in the group that personnel who come to schools committed, although there are some who do not possess the aptitude required, are in general superior or better suited for this particular job situation than those who just get inducted and sent to a given type of situation.

Some discussion was devoted to specific tests in the ACB, as to what scores are used for selection for specific job areas. This is generally familiar to all of us, so I will not go into the specifics. It was mentioned, however, that the electronics test, which has been placed into use as a replacement for the electrical information and radio information tests, was placed in the battery, at least in part, because the two earlier tests were not sufficiently discriminating. As we are able to get measures which discriminate at all levels in a given aptitude area, we are freer to use those tests and make assignments in relation to varying levels within a particular job field. This is the direction in which test construction has moved.

Given better discrimination in terms of levels, it would then be possible to provide a higher degree of satisfactory input in terms of numbers of people who are qualified in an area, without any loss in the quality of the people.

The problem that the young officer has to contend with when he enters the basic course in his branch was discussed at some length; the problem being that when an officer enters that course he in effect lays his commission

on the line, because if he fails the basic course he can lose his commission. There seemed to be some divergence of opinion in the group that divided between the old line schools and the more recent technical schools. The opinion was expressed that it may be profitable to use aptitude test information prior to an officer's being enrolled in his basic course. Such information might, particularly with respect to certain of the technically specialized schools, provide both the school and the enrolling officer with the knowledge that, aside from other qualifications, the specific aptitudes required are indicated to be at a fairly specific level. It might even prevent an officer from being assigned or enrolling in a course in which he apparently does not have facility in the aptitudes required.

The general problem of examination procedures, and elimination procedures, was also discussed, and I think I can say that no clear consensus was reached, except that perhaps we should move toward more uniform examination and elimination procedures among the various schools.

In terms of recommendations or suggestions, we came up with two. One, related to the subject that I just mentioned: that a greater degree of CONARC control could be exercised in connection with admission examinations and elimination policies and procedures at the various schools, so that we would move toward a more uniform procedure in this area.

The second recommendation or suggestion, relating to the officer's entry into his basic course: that consideration be given to administering aptitude area tests to officers, in order that an officer who is in general completely qualified might be prevented from getting into an area in which he does not have the requisite technical or special qualifications.

Mr. Helme, did I cover everything satisfactorily?

MR. HELME: There are one or two points that I would like to add in terms of clarification.

One was on the question of enlisted commitments. The point is that among students who do not meet the prerequisites for a given course, those who are enlisted commitments did much better than those who are simply sent; but it is among the group who are not qualified in terms of prerequisites that this distinction takes place. I imagine everybody understood this, but I wanted to be sure we did put it this way in the record.

The other is a point which I failed to bring up as discussion was cut short by time at the end: that there is research going forward using the Army classification battery for officers entering basic courses, so this is actually a little further forward than might have been gathered from our discussion.

MR. HEYL: This would almost eliminate the necessity for making the second recommendation.

MR. HELME: The recommendation is still of importance because the whole thing does represent a step, I think, forward in our thinking about this, and it is interesting that the recommendation would come out of the group, whereas it was not in our discussion.

CHAIRMAN VALLANCE: Time for one question.

A MEMBER: I am confused on the recommendation with respect to these aptitude tests for officers, before entry into their basic course. Before an officer goes to his basic course, he has already been commissioned in a branch. Are you suggesting the administration of these aptitude tests before he has been committed to a branch, or after?

MR. HELME: The point came out in connection with officers who were taking what has been termed a more technical or new technical courses. In fact, the point was rather clearly made by persons representing the Armor School that this was not a requirement that they would feel important to their particular branch.

On the other hand, there are certain courses, of which the Nike officer might be an example, where it was felt this would be valuable; and in general, that it would give a man an opportunity to retain his commission elsewhere, rather than being pushed into a particular type of training, such as a Nike officer taking a course to qualify for that.

A MEMBER: A man does not take a Nike course for a basic course.

MR. HELME: Well, if we knew in advance how the man was likely to make out—

A MEMBER: I am still confused here. A basic officer comes to Belvoir to take his basic course. You would suggest we give him an aptitude test, and if he cannot pass the test, he does not take the course. What are you going to do with them, send them out to the troops without the course?

MR. HELME: I think this is where the point was made for a closer degree of CONARC control so that a place could be found for this officer who is otherwise qualified. I am saying here that if he is not qualified in terms of special requirements, say in the Engineer Branch, that would not necessarily mean that he would be unqualified in terms of being an officer over-all.

A MEMBER: An officer of a branch is required to complete the basic course of that branch.

MR. HELME: I know. This presumably is one of the difficulties that was being faced when the recommendation was made.

A MEMBER: If you were willing to carry your recommendation back to the point that before he was selected for commission in the particular branch he must pass certain aptitude area tests, I might be inclined to go along with you, but I certainly take exception to that statement unless that change is made.

A MEMBER: I do not think the proposal is to administer the entire present group of aptitude tests. In fact, there is a rather large-scale research program being undertaken at the moment to develop a whole differential battery of tests for officers. These tests obviously will measure many of the qualities and abilities not in the enlisted qualification battery. This would be used before a man's first assignment, or before he was sent to branch training, as a guide line to the development of his whole career progression. Now this is in the research stage and so far removed, as far as implementation is concerned, that there is no point in objecting yet.

DR. PICKARD: What you are suggesting is quite different from what he said.

MR. HEYL: I think I got things off the track here by trying to oversimplify. I do not think the intent was that in all cases such tests would be administered, but there are perhaps specific situations in which this might be desirable.

CHAIRMAN VALLANCE: Okay. I guess that clarifies that point. I am glad the topic did come up for discussion.

I think, at the risk of frustrating some budding questions, we had better plan to move on to the final activities of the day.

SEVENTH GENERAL SESSION

Thursday, 30 January 1958

The Function of the Educational Advisor

CHAIRMAN VALLANCE: I hear the transportation schedules are creeping up on us, and one of the effects of this creeping is that we are going to change the order of the presentations in this final panel discussion.

We are hoping that Dr. Allen will be able to stay with us, but he may have to go, so we are going to lead off with the presentation by Dr. Robert Allen, who is Educational Advisor to the Quartermaster Training Command. He has slightly revised his topic, and he will tell us what the slight revision was.

Dr. Allen.

DR. ALLEN: Dr. Vallance, gentlemen:

After being here for three days and having worked on this three or four weeks ago, I find much has been said concerning methods and training aids. However, there are a number of ideas and points I might mention that are of interest to me and may be of some interest to you. My topic is "Factors Bearing on Methodology."

One of the things that I have noted is the fact that, except for the speeches of General Wyman and General Gavin, we have not talked too much about the student.

I assume, and I know you do too, that the primary purpose in life for us is the student and his growth. We need to know more about the student. We need to know what makes him tick, what gets his attention, what holds his attention, what helps him understand, what agitates him if we are going to make some real progress in methodology in all these areas we have been discussing. We have to know a lot more about this basic man than we do at the present time.

As a matter of fact, one of the significant items in General Gavin's speech last night was his comment concerning motivational research, and his reference to the organization man.

At the present time I am doing a study under the direction of the Secretary of the Army's Office, and I was sidetracked. Motivational research is opening up new fields to me, which, in time, I hope will lead to improvements in the area of methodology; but again, I feel that too often in this area

of methodology, we spin our wheels because we are talking in a rather superficial sense without knowing the basic man.

Now at the risk of boring you, I will re-emphasize the present situation.

We are in an age of changing concepts, new weapons, lightning communications, and the use of more highly technical individual and more technical unit equipment. We are talking about much more highly improved fighting men, both officer and enlisted.

We are thinking in terms of small, hard-hitting, highly mobile, compact units, striking quickly. This calls for leadership of a new dimension, more creative, independent, and resourceful than in the past. The big decisions may not always be made alone by top level individuals. The "Indians" at the lower level may be placed in that position, and what they do may make the big difference in an operation. For example, a minor incident could touch off a major war today.

Under these new concepts, then, it follows that the unit leader, the individual soldier, must be smarter, better trained, more alert, and a real opportunist. He will have to know how to operate with other units, other nation units, and sister services. He must be a better technician and a more knowledgeable soldier, because we will not have a vast depot system to send him a replacement every time an engine misses a beat or his personal equipment fails.

So the first factor is this new fighting man. To have this man and this leader, we must embark on a new and more dynamic and rigorous training program, one characterized by these very things, reflecting the development of dynamic thinkers and individual soldiers with pride and initiative. And in support of this combat soldier is the more highly specialized and more technical EM and administrative tech service officer; and here, too, there is a need for training methods and procedures that will qualify soldier specialists in a ridiculously short period of time.

I will not go into the problem as far as technical services are concerned, although I think sometimes we neglect them when we concentrate on the combat individual.

In any event, the rapid movement of troops, swift changes in geographic locations of battle, and constantly changing items of equipment and a whole new weapons family, make the future of the logistician one of great challenge. The developments in logistical leaders, as well as combat leaders, will call for new thinking in our educational organization as well as methodology.

But what is the place of the Educational Advisor in all of this?

Well, to me it is quite simple. (Usually I am accused of oversimplifying things.) The Educational Advisor—with a staff of transient faculty personnel—must provide the creative spark, must develop the dynamic programs of the future; we must stir the uncreative, prod the unwilling, and in short be the right arm of the Commandant and his Staff in the development of new and greatly revised courses of instruction.

We have not talked about how we change courses of instruction at this meeting; we have talked around but not about new and different methods. I say it is not enough to look wise and smile knowingly over a pipe and say, "Yes, this sounds pretty good," or, "This meets some criteria or standard." I think we have to offer more concrete suggestions as to <u>new</u> avenues of approach.

Now what suggestions do I have? I have nothing that has not been rehashed many times and in many ways already. But I do think there are certain factors bearing upon methodology that we might consider—where we might apply pressure. Some of them, by the way, have been discussed or implied, but perhaps I might put a little different light on them.

To begin with, we talked here about job orientation and qualification. I sum up the whole problem in training, and again I may be exaggerating and oversimplifying, with one word, and that is qualification. When we develop courses of instruction, we should begin and end with the factor of job requirements. I don't care whether you are talking about basic EM or advanced officer courses, if you cannot spell out the job and duties that this man has to do, we can never be sure of our teaching program.

I have heard the statement made, and I do not agree with it completely—(sometimes, it leaves me a little cold)—that with EM tech courses, it is easy to identify and pick out the job components and train for them, but at the advanced officer course level, you cannot do this. I say not only that you can, but you must. I also say, in development of our advanced officer courses—and I am speaking now of branch schools and your company and advanced officer courses—we have to "job-center" our programs of instruction and not "subject matter-center" them.

Too often, if you examine the POI you will find little pieces of subject matter that are not integrated with or do not bear specifically on major job areas. For example, the advanced course, in my book, is the staff officer course. He has to be able to develop the ability to work with a staff—as a matter of fact, one of the things we should look at is this whole business of what makes a staff officer tick. At present, we are giving the student a mass of details and bits of knowledge; and this may not be important because it will change tomorrow. But can he read, can he write, can he express himself so that others can understand him? This may be more important; this may be the "qualification" we seek.

Perhaps we should teach in school what cannot be learned on the job. I wonder sometimes whether we are not wasting our time going over petty details that a man can learn very easily on the job under enlightened supervision.

Another factor, often overlooked, perhaps the most important part, is the development of attitude. Some of us, perhaps not all, will agree that it is more important to have a man develop in the school system respect for the job and what he can do—in short, an attitude—than be able to parrot job details and understandings.

I think sometimes we lose sight of this aspect. For us in the Quartermaster Corps, motivation is a great problem. It is a lot easier to train men for the more glamorous tasks than it is to train laundrymen, cobblers, tailors, cooks, and the other less glamorous tasks. Yes, we have a problem in motivation. Indeed, attitude is a big factor in methodology.

Another point about methods: I believe that methods should reflect in a very natural way the thing you are trying to do, and that includes the objectives, nature, and content of the program, as well as the individuals concerned.

There was a reference today to this point—that you do not need a body of water to teach swimming. I agree wholeheartedly that in certain areas if

you must have simulators for economic and practical reasons, you should use simulators. However, there are other areas where the first prerequisite is the actual facilities, if you are going to do the job at all. To teach swimming, no matter how much time you spend, you still need a body of water deep enough for a swimmer, otherwise you are wasting your time.

I would like to offer a principle of methodology along these lines: Our methodology should be such as to bring the student into the job situation as soon as possible, under the best simulated or, if possible, the actual job conditions.

The sooner you get him into the job the way he is going to work, under the conditions he is going to work, the sooner you are going to get him trained, and the sooner he can go to work for you.

In the EM courses, this is most easily done, or more easily done. The MOS description provides the job description. In our officer courses, we must identify better what the major job assignment might be and prepare the officer accordingly. It is in this interpretation of "what" and "how much" that we go astray.

Here is where curriculum forces our hand in methodology. The job content or description is a major item in our methodology; it has been my reaction over some ten years of curriculum meetings and forwarding of programs for approval, that we try to teach everything at almost every level. Ofttimes, the digestive learning tract becomes clogged and we are kidding ourselves as to the mileage obtained in terms of the instructional expenditure (by the way, this is phenomenal for most service schools). Trying to accomplish too much in too short a period of time forces us into poorer methods or exaggerations of methods.

Another point: we can spend a lifetime working on curriculums and methods, and it does not mean a thing unless we have the right instructor. General Newton told us about that. I believe I am speaking contrary to all schools of thought as far as this is concerned when I say whether you like it or not, the curriculum is teacher centered. He is the fellow who makes or breaks our program. If you do not have a good teacher, I do not care what your methods are, or how well you prepare your curriculum, it is not worth the powder required to shoot it up.

In line with this, I would like to look into the future. Within the next few years, we are going to lose a lot of our 20-year men. As a matter of fact, I am in an officer-training school myself in the Naval Reserve. I would say in the next five years the effective officer-teaching personnel of the Reserve Schools will be gone; most of us teaching will have our 20 years. Can we expect the youngsters to take over this job? We are not getting EM's in the regular Army establishment, the top-notch high school graduates who will make top NCO's; we are not getting the best 2d Lieutenants for career officers from the ROTC units. I want to know who is going to do all the teaching ten years from now?

I think we have a good problem here.

The next point about methods is tied in with doctrine and the lag in published doctrine.

It always bothers me to hear people say, "Let's not teach old doctrine because new concepts are yet to be published; let's wait." I say it does not matter whether doctrine is passe or not; we should teach them what we know

to be and force them to project themselves into the future. Whatever we teach, it is going to change. Things are going to be different, but if students can understand the present situation, they can pick up the new doctrine when it arrives.

And let us have some good solid thinking as to how we can better utilize what we have in our schools. We have men, equipment, and materials—still there is duplication, overstaffing, and the like in our basic organizations—let us improve before outsiders make us do so.

Another point about visual aids that we sometimes forget—and again, I am giving you a string of miscellaneous ideas off the cuff and probably you disagree with them—but often, visual aids are used as "sweet pills" to make learning easier, instead of forcing people to think.

I know, as one individual, there were times when we had to go to school—I hate to date myself, but this was in the 30's—and listen to someone lecture all day. Sometimes it was pretty dull, but you had to sit and force yourself to project and think and understand what he was talking about.

Now this man might be considered a real jewel because he had tremendous knowledge of a subject area. He did not have any fancy visual aids. Well, was this completely unhealthy? I do not know, but I do know that it forced us to think, to listen. In other words, the difference was an active student instead of a passive one. Perhaps this is a factor to consider.

I think reference was made to the fact that modern visual aids are contributing to the development of this dynamic new thinker of the future. I say that often they are making a passive "catcher" out of the student. I wonder.

Another idea about visual aids of possible interest—more crude visual aids may be used in teaching. I am ready to go back to the blackboard. In fact, I am a proponent of the "back-to-the-blackboard" movement. Many times, we can explain something better in a crude way. I am all for the instructor who makes his own aids rather than uses a huge, expensive training aid that costs hundreds or thousands of dollars.

Do not misunderstand me. I believe in simulator aids; I believe in good training aids; but I think sometimes we go overboard.

Another area of interest—selection, classification, and assignment. As far as I am concerned, these are the weak links in the entire training system. I realize that some fine work has been done, but as long as we train men who, in many instances, are not properly assigned, I am unconvinced. I do not think that we can afford to spend the millions of dollars that we do in training men, and then have students who are technically trained go out and be assigned or placed incorrectly as a matter of administrative convenience. At present, this may be a commander's prerogative, but I think somebody should start thinking of administrative controls that force this proper assignment to the point where we make maximum use of our trained people. I believe the Navy has us whipped as far as the assignment of enlisted technicians is concerned. We must apply pressure to improve this situation in the Army; let's not waste our talent, our school graduates.

I think there is not enough on-the-job training and supervisory development. We need more of this and less emphasis on running a formal school program for every training need. I do not believe in many instances that we are doing our job as supervisors in the development of subordinates.

An officer in the Army should be both a student and teacher for life. Many of the things that we are sending him to school to learn are things that he should have the ability to sit down and figure out—learn for himself and teach others.

I think there is a crying need for basic research in education. I was certainly happy to hear of all the wonderful research being done by HumRRO. But, many of the other so-called research directors (I am referring not to the military, but to the civilian organizations in many of the large school systems, universities, and departments of education) while they may be doing a lot of useful things, they are not doing the basic research that is crying to be done.

(Reference the Journal of Education Research, a recent article by D. G. Ryons entitled "Are Educational Research Officers Conducting Research?")

Despite the magnificent efforts of HumRRO, and perhaps also of the AG Section, I think we should stimulate a greater pooling of knowledge and insist on a greater emphasis for research service which is usable to the educational specialists and the training personnel.

There was some discussion this afternoon about an abstract service, and I had pre-meeting notes on that, because I feel it is particularly important. I believe that we need the formation of a clearing house and research center to provide for better communications and abstract service, perhaps by way of quarterly bulletins reflecting the basic research and practical experiences of training schools and commands to the point of application and execution. There is so much going on that I wonder whether, in some instances, we are not losing sight of the efforts, experiences, and advances made in other service schools and commands.

I believe somebody should think about establishing such a pool to save us time—spinning our wheels in all directions.

As a matter of fact, if you want to carry that further, someone should study the possibility of an IBM abstract center service of all research referring to training, to include technical publications. With all the research and instructional materials that are now being developed or completed, I am sure that nobody knows, really, what information is available throughout the Department of the Army. I am sure that there has been much lost time and duplication, and I think some sort of service should be set up to code this information where individuals who are interested in research can write and get an up-to-date reference list.

I think we need a better trained teacher. How to go about this, I do not know. I think one aspect which reflects some of the thinking in this area has to do with the discussion we had today on television. I do not think for one moment, for example, that we need television right now to train quartermasters, but it is our job to be prepared for mobilization. Then, instead of three or four thousand students, we might have 20 or 30 thousand to teach, and we would not have enough qualified teachers to do the job. As educational advisors, we must propose ways and means by which we can be prepared for this great moment. One of the means of assisting the hard pressed school administrator could conceivably be television. And nothing gets me more burned up than to have someone close out with the statement, either/or—either it is good or it is not good, especially in an area where we have not begun to explore, and television is one of those areas.

Now I do not say that this is the whole answer, or a panacea, but I think it may be a factor. It is worth exploring.

In several meetings—I am not speaking of this one—I have heard individuals say, you cannot do this, or you cannot do that. Why not do it—or at least try? Is there any law against it? This attitude worries me when found prevalent among educational leaders.

I would like to mention just one more item, if I may. We, the professional educators, should meet again to read learned papers, to exchange ideas, to demonstrate new methods and new visual aids, to show what we are doing that is different, to understand what others are trying to do, and perhaps some day we will be able to progress to the point where the changes we make are more worthwhile. I think we need a breakthrough in education, just as we do in our technological struggle today.

Thank you very much for listening to my miscellaneous list of factors and ideas.

CHAIRMAN VALLANCE: Thank you very much, Dr. Allen.

We will move ahead now so that we can have discussion and a little time at the end for some commentary after the last speaker.

Our next speaker is Dr. Tate from the Infantry School who will speak to us on the "Educational Advisor as Consultant on Tests, Measurements, and Grading."

Dr. Tate.

DR. TATE: I consider tests, measurements, and grading as tools or procedures for helping in the process of evaluation. This evaluation may be of the School as a whole, of students, of instructors, of courses, or of some other part of the School. In the Infantry School we have an educational specialist whose main job is handling tests and measurements and who helps with the grading to the extent that he processes about 2,000 tests a year which are given in the Infantry School.

The Educational Advisor gets unusual problems. Ordinarily the routine problems of a department director, committee chairman, the instructors, or the educational specialist never reach me. Sometimes people consult me to help solve a peculiar facet of some problem on testing and measurement which may have an impact on the mission of the School or affect policy. Some may report unfavorable student reaction.

Some of these issues I initiate as a result of discussion with students, with the Director of Instruction, or with people who are critical of the testing program. In these cases, we initiate some sort of research to get other people's opinions, to get facts on the problem and to arrive at some suggestions, conclusions, or recommendations.

One of the purposes of this conference here has been, I think, to point out areas in the field of measurement and other kinds of educational problems where the educational advisor may work with research agencies that are now in existence. In this respect, the Adjutant General's Office is one sort of research agency and HumRRO is another type of private research agency available to the Army.

Many of the problems which arise in our testing are not long-range and therefore would hardly lend themselves to elaborate treatment. On the other hand, if HumRRO in its research finds problems and solutions in the field of testing which helps the School, the School should be informed.

One of my functions on this panel should be to try to get from the conferees here what they believe to be some of the kinds of problems which lend themselves to broad research, some of the main tools of research, and the uses of these devices and methods. We cannot appraise progress or achievement effectively except through careful measurement.

Since I have been Educational Advisor at the Infantry School, I have been consulted in various problem areas.

The value of the ordinary examinations has been under question. To what extent will examinations eventually be done away with? What devices would make examinations less necessary? At the Infantry School we are continually studying the improvement of examinations. We have made substantial progress in making our examinations more valuable and sound. We have not reduced the number of examinations as much as we would like but are in the process of discussing a more comprehensive examination which might take the place of several sketchy ones.

Another problem is how to set up a truly valid test. The School is convinced that performance tasks make excellent content for an examination. Such a performance test is believed superior to other types of tests. The users of such tests believe in their effectiveness. These include the administrator, the instructor, and the student. In solving this, we get the instructor to construct his own test with actual performance elements in it, all with situations which are as close to the real situation as possible. From a measurement standpoint, this may not be the most valid test, yet it seems that a large part of the criterion is contained in the test itself. We convince the student, the instructor, and the senior officer who will sometimes supervise this student, that it is a highly valid test.

How are we to set up the failing score? This is a very sensitive point. The failure of a large percentage of advanced students to pass a test becomes of serious concern, particularly when one realizes that our failure rate for regular advanced students is not over 1/2 of 1 per cent over the last few years. One immediately suspects that a poor test was used, poor instruction took place, or the students were inadequately motivated. If it is a matter of motivation, the student needs something drastic. On the other hand, if there is something intrinsically wrong with the examination, flexibility of grading is needed to allow for a correction. This procedure is followed in practically every progressive university.

The dilemma is caused by the traditional supposed sanctity of 70 as a passing score on all tests. This is a throwback to a system of education which decreed that regardless of the examination, content, or anything else, when a student made 70 he passed and when he made 69 or less he failed.

My concern is that there seems to be no solution. We advocate at the Infantry School that the failing score be determined using many considerations. The kind of students in the class, the intricacy of the subject matter, time spent on the subject matter, and several other things are considered. We believe that if the material is normal in difficulty and if you have what seems to be a normal class of students, not over 6 per cent should fail. As a matter of fact, we have a ruling that if as many as 25 per cent fail an individual examination, a careful analysis must be made to find out why. We understand that if more than 15 per cent fail a course, CONARC must investigate for D/A.

Another problem is how can we resolve the differences between test results and a student's rating based on his actions, his attitude, his leadership proficiency, etc. Recently a student, a Distinguished Military Graduate, had just a few points over the minimum but he had a very poor attitude. It was questionable that he should ever have received a commission, yet the decision was made not to decommission this student because he had made over the minimum. A problem that we are studying right now in this respect, is some sort of testing or evaluation of students which will take other things than learning into consideration.

A controversial problem has been—Should ranks be reported to students? Some of the unfavorable results of reporting ranks have been the lowering of students' morale and the cutthroat competition that takes place between some Regular Army officers for an extra point. The attitude seems to be that all the student needs to do is "max" the test. The worst example of this kind of attitude was the resentment on the part of senior students toward the instructor critiquing presentations after the program of presentation had begun. Some students complained that any critiquing would tend to make the remaining students better and thus give them a higher grade!

Another outcome is that students tend to want to learn what the instructor wants them to learn or what is in the textbook rather than to learn to solve problems more effectively and learn to make new decisions based upon principles and facts.

Some pertinent questions are—To what extent should mental capacity test scores be used in evaluating officers? To what extent is motivation a product of mental capacity? Do you think we should use the formula of mental-capacity-divided-by-performance-is-equal-to-motivational-index and then turn around and use the motivational index in grading? Should ranks be reported to higher authorities? We have advocated that if there is a positive use for such ranks, they should be reported. If there is not, if they are reported only for information, their use is doubtful.

Should the use of class standings be continued? In our advanced classes, every man is ranked by number. Again we have this vicious practice of unrealistic competition. Perhaps we should have ranks by groupings, for instance, the top tenth, 2d tenth, etc. The grouping should be close enough to ranking to give us necessary information and yet not so close as to stimulate the fight for the extra point.

We have been considering the use of the standard score and its faults. If the test results are skewed to the high or low side, the result of the standard score will not be accurate. We believe that a linear conversion is much more accurate since it compensates better for abnormal distribution of test scores.

The School uses order of merit ratings in the Officer Candidate Course. This practice must be supervised very carefully because it is too easy for a rater in checking the record to jump to a damaging conclusion in considering the lowest rated man in a group even though that man may be substantially higher in quality than the top man in another lower type group. If the order of merit rating is used to eliminate students, then the dependence upon it becomes more dangerous than ever.

The Commandant raises such a problem as "Find out what other service schools are doing on examinations, the announcement of class

standings, the ranking of students, and whether or not examinations should be eliminated." This calls for a survey of the opinions from other service schools, and in addition, of what our own staff and faculty think is important. If there is sufficient time, this kind of problem would be pursued from many angles and the results submitted for action by the Commandant.

The educational advisors here have been a great help to me in answering many such questions. Most problems come from the Assistant Commandant, usually proposed by the Director of Instruction or by the Secretary's Office. A recent one was to determine the extent to which the passing score of BIOC should be raised and be made less flexible. Persons arguing for raising the passing score were doing so because there were fewer failures by instructors and because remarks had been made such as, "I don't see how this man ever got his commission." Several students made lower than the traditional 70 per cent. On such occasions the committees recommended adjustment so the failure rate would not be excessive. Ignored were (1) A real reason for fewer failures was a higher quality of students. (2) The fact that these commissions were much harder to get than had previously been the case. (3) 70 per cent is meaningless in itself. (4) The instructor and the faculty boards should be permitted flexibility to deal with borderline cases with the decision of failure to be determined when the students appear before a board. When the facts were given to the Assistant Commandant, he realized that raising the passing score would not solve this problem.

Many problems come in from the department directors. A typical one is—How do you arrive at failing scores and to what extent should the department make the failing score flexible? I first try to convince the instructor that the educational advisor does not know the factual answer but can only point out areas for further consideration and analysis. When the director examines the processes of the test and whether or not the material in the test is absolutely necessary, he begins to realize for himself what is required for a student to pass. An example of material that is vital and must be known on the examination is in the jumpmaster course. If the student jumpmaster fails to check the jumper's gear, which is only one element in the examination, he fails, as the jumper's life may depend on this point. If the purpose of the examination is to determine the rank of the individual in the course, it really does not make much difference where the failing score is set. In all probability, the nearer 50 per cent it is set, the more discriminative it may be.

We have tried to organize the educational advisor's office so that the instructor, regardless of his level, feels that he can come in for help. We try to make him feel that we do not know all the answers, but also that we will help him find his answer, suggest procedures, give all the assistance we can. Many instructors ask us to preview a test as to quality of the items, answer key, critiquing, whether the student will like the test, time allowed, the need-to-know value, and many other miscellaneous points. We suggest points as a result of experience in the School which usually help the instructor in finding answers for himself. We do try to insist on questions being challenging and of real value in determining what a student knows. If the question is not of practical value, we try to get the instructor to leave it out.

Some areas that we have not touched upon, but must consider are the setting up of research problems in tests and measurements; determining the content of the Instructor Training Course concerning tests and measurements; applying psychological testing and statistics to certain educational problems, such as the evaluation of officer candidates, excessive attrition, the General Military Educational Development Test Program; setting up prerequisites for certain courses; making recommendations to the Director of Instruction in the selection of diagnostic tests for the Instructor Training Course; making recommendations to the appropriate departments on study and testing program to determine relative level of quality of students as a result of selection; writing job descriptions for educational specialists; making recommendations on the BIOC evaluation program; keeping abreast of what is happening in tests, measurements, and grading in other service schools so that we can get the benefit of the best thought in the field; and interviewing various instructors for ideas on how to improve evaluation procedures.

Unfortunately many actions cannot come by persuasion. They have to be done by command decision. If command decisions are necessary, by their very action, resistance may be built up to the extent that some of our projects fail. In giving advice, efforts are made to sell the idea not only to the department director, but to key instructors and staff members who may have thought the problem out from several points of view. If this is done in advance, many good ideas become operative.

I hope that this has stimulated you to bring to our attention the kind of problem in the field of testing, measurement, and grading that you face. I am particularly anxious to get your reactions to this question—To what extent should the educational advisor be thinking of far-reaching, broad areas in this field of evaluation, against the extent to which he should be trying to solve day-to-day problems?

CHAIRMAN VALLANCE: Thank you, Dr. Tate.

I guess we would best move on and finish up our seminar with Dr. Poe, from one of our very newest schools, The United States Army Aviation School, Fort Rucker. Dr. Poe wants to give us some words on "The Educational Advisor as an Administrative Consultant on Procedures in Educational Administration."

Dr. Poe.

DR. POE: Dr. Vallance, and the more hardy members of the 1958 Military Educational Advisors' Conference.

I consider it a distinct honor to talk with you on the topic, "The Educational Advisor as an Administrative Consultant on Procedures in Educational Administration." The preciseness of the subject reminds me of the task I had in isolating, defining, and limiting the scope of my doctoral dissertation.

The title starts out with the large topic of the function of the educational advisor, and then immediately reduces the scope of such duties to those performed as administrative consultant. It continues to diminish to the extent that it concerns only procedures, and finally it limits procedures to those related to educational administration. Theoretically, the title seems to restrict discussion to the extent that I ought to be able to thank you for your kind attention and sit down.

Unfortunately, despite the fact that this is the last presentation of the last session of our Conference—and thank you, Dr. Vallance, for not putting me first—the topic has so many practical aspects that it cannot be dismissed on the basis of faulty theoretical logic.

As I analyzed the topic prior to the preparation of this report, I concluded that the purpose of my presentation would be to develop principles for the guidance of an educational advisor as a consultant on procedures in educational administration.

Mr. Porter has previously pointed out those administrative areas requiring the development of such procedures. However, it is manifestly impossible to develop a comprehensive list of procedures in the time that I have available. In fact, it would be impossible to establish one specific set of administrative procedures that would be applicable to all Army schools. Therefore, this presentation will be concerned with the methods of determining, selecting, using, and evaluating educational administrative procedures.

These will be demonstrated in a few examples that I believe important, and then each educational advisor ought to be able to establish his particular role in determining the specific procedures required at his school. If not, I hope that the presentation of these principles will engender discussion concerning their use with regard to specific procedures.

The key word in the subject, is procedures. The most pertinent definition that Webster provides is that procedure is a particular course of action or way of doing something. Thus, the purpose of procedure is to accomplish something; this something, in accordance with our interest, would be an educational administrative objective or goal. A procedure must be so closely related to the goal that it strives to achieve, that it is impossible to discuss procedures without consideration of the goal.

Therefore, our first principle is that procedures are primarily determined by goals. Theoretically, we know there are many different plans of action or procedures that can achieve any one specific object. So we are confronted with the selection of the best procedure from among the many that are available.

Therefore, the second principle will concern the establishment of general criteria for choosing the best from the many available procedures. It is likely that these criteria are

(1) Will the chosen procedure accomplish the objective? The fact that some will defeat the end they seek must be considered a part of this criterion. The probable success of a procedure can best be determined by prior knowledge of its success in similar situations. Some practical or vicarious experience is necessary to select procedures that will probably be successful.

(2) Is it economically feasible? Will sufficient financial support be available? Consideration of required facilities and equipment are a large part of this criterion. If it is too expensive, can other procedures that are more economical be substituted?

(3) Is it reasonable in its demand upon the school's staff and school's students?

(4) Will use of it hinder the achievements of other objectives of the school?

All of this prior discussion indicates, despite the personal preference of any of us as individuals for specific procedures, that there is nothing sacred about any procedure, per se.

The criterion for evaluating a procedure is its practical results in achieving the objective. If one does not achieve desired results, continued use will be detrimental to the effectiveness of the school. It should be replaced as soon as possible with a more efficient procedure.

The next principle I should like to present is that educational administrative procedures are not designed to lighten the work of administrators. The procedure should be designed to enable administrators to spend less time on less important work, and more time on more important work—such as, in this instance, the improvement of instruction.

And the last principle that I would like to discuss is that administrative procedures must demonstrate to instructors that the instructors are trusted by administrators, and that they will be provided with all the support that can be made available. This principle is based upon the fact that the effectiveness of a school is dependent upon communication between the instructors and the students. Using a military parallel, the efficiency of the commander depends upon the ability of his front-line troops, the instructors, to invade the privacy of students, to capture their attention, and to secure their cooperation in learning.

Though a military commander would never harass his front-line troops, we sometimes find military school administrators harassing their instructors by restrictive procedures. For example, perhaps the administrator eliminates some privilege enjoyed by all instructors because one instructor takes advantage of it. Certainly the elimination of the privilege is the easiest procedure for the administrator to employ, but the adoption of this plan violates priorly established principles; first, that administrative procedures are not designed to lighten the administrative load; and second, implementation of such a procedure may hamper achievement of our objectives by decreasing the morale of all instructors. The proper procedure would be to penalize the transgressor and not the 99 1/2 per cent of instructors who demonstrated that they could be trusted.

This principle can also be stated affirmatively in military terms: "A commander should feed his troops meat whenever it is possible."

It is believed that these few general principles about the establishment and evaluation of procedures will provide sufficient guidance for educational advisors.

So now I shall conclude with a discussion of why educational advisors should be consulted by military administrators on the establishment of educational administrative procedures.

The military executive personnel of schools must have had considerable administrative experience. Why can they not establish the administrative procedures essential to accomplishing the mission of the school? The reason lies in the difference between the objectives of the military administration in their experience and those of conducting a school. In accordance with our first principle, procedures are primarily determined by objectives, or, different objectives require different procedures.

Educational objectives are achieved by securing cooperation in mental attitudes and activities, while military objectives can be achieved by a policing action which forces certain compliance in physical behavior.

Despite the fact that military administrators are familiar with procedures to achieve military objectives, they are not as familiar with administrative procedures necessary to achieve educational objectives.

So in accordance with this philosophy, Army schools have educationally trained civilians to advise military personnel on the selection, implementation, use, and evaluation of educational procedures. Therefore, each of us has the responsibility of selling his services as an educational advisor to new key military administrators as they assume such duties. It is mandatory that we do this to ensure that proper administrative procedures are used, and that administrative continuity is maintained when administrative personnel are changed.

Thank you.

CHAIRMAN VALLANCE: And I thank you.

I think we ought to take time for a question or two of the remaining panelists. I think there were some questions—General Newton?

GENERAL NEWTON: Just a new bombshell I would like to drop. I was particularly impressed with these last three presentations, and I am also impressed with the fact that you do not have enough time to listen to an appraisal of the ideas presented—there may be another conference.

I feel the Army of the future is going to be much different from the Army of today. Since I have retired I have had a lot of time to reflect, and I think about this Army problem. I believe there are going to be three services in the future, a technical service, incorporating all technical aspects of the Army, a management service, and a combat service. I think that in another ten years you will find you have those three general branches in the Army.

In officer schooling, an officer, for instance an infantry officer, finishes the basic course and takes an advanced course. He elects the advanced course he takes. He goes to an ordnance school, guided missile school, or management school. He elects the school to broaden his concept and fill in his own shortcomings. When he is ready to go to school, he takes an examination to determine his qualifications from the standpoints of capability, his basic courses, and his service. When he goes to school, he elects the courses he takes. He does not take a standard course from beginning to end.

I have just returned from a year in Europe as a guest of the German, the French and the Italian governments, making a study of their school systems. All of their officers are required to be proficient in another language. I think we must do something toward this. I believe we are going to enter a new era, a new area in the field of combat, one in which we will be faced with the problems of having a service made up of three armies, a combat army, technical army, and management army. Please think about those things for the sake of the Old Man.

CHAIRMAN VALLANCE: Thank you, Old Man.

We are glad to have your final summary, General Newton. I know you have been around this work for a long time, and I was not at all surprised that you would have something final to say to us as we come to the close of our Conference.

I want to make a few final remarks and invite one additional comment. Our objectives and our methods have been broad in this Conference. We

have tried to increase communications between the educational advisors and their respective directors of instruction; we of HumRRO have been interested in the opportunities that we might find for allocating our quite limited research resources to problems of army training. We are full up to the gills with ideas on what we can do.

We are also interested in these training problems that will provide us, in some future work program, with a basis for guidance in the allocation of our limited resources to the most important ones. If you are interested in any discussion, kindly submit requirements through channels.

The value of the Conference has been unspecific, fairly general, and may be long in realization. If nothing more has come out of the Conference, it has been an exposure of problems rather than their solutions, and as we always tell ourselves in research, defining the problem is as important as any other aspect of the process. So, we have not solved any problems, but at least we have exposed some for further attention.

I want to thank Colonel Baker of CONARC for his help in getting this meeting organized, the speakers who have contributed the main content of the Conference, our discussion leaders for their work, and the reporters—who have turned in a surprisingly good job under our method of operation.

We plan to turn out the record of the Conference. I hope to get it out soon. Our method of editing I propose as follows, and if there are some serious objections, I would like to know about them. We will edit the transcripts as we receive them. We will translate some of the conversations into prose, and otherwise try to make it a little more connected where it has been somewhat garbled by our method of discussion.

We will send to the reporters and to the speakers copies of what is alleged to have been said and set a short deadline on return, perhaps about a week. We want to get the report out as soon as we can while the meeting is still fresh in our minds.

As noted in the program, the University facilities and the HumRRO building will be available if anyone wants to stay over to use a conference room for any further discussion tomorrow. We have a couple of conference rooms which will be available.

And now I would like to invite a final word from a man who may be designated by his various functions as follows: Dr. Oswald Colclough, Vice Admiral, USN, Retired; Professor of Law, and Dean of the Faculty of George Washington University. That is a biographical summary in a sentence.

ADMIRAL COLCLOUGH: Dr. Vallance, and gentlemen:

Sitting back there with Dr. VanEvera and Dr. Crawford, and people who were leaving to catch a train or for other reasons, I was reminded of a story the Chief Justice of the United States likes to tell, Justice Warren, who, as you know, has been in political life for years. He tells how he used to travel throughout California giving political speeches. They went to this block, to that square, and so on, and in order not to become involved in any quarrels, they always spoke in alphabetical order.

He tells of the night that he was standing awaiting his turn, until finally there was only one fellow left in the audience. So he said to himself, shall I talk or not? And, of course, a politician never fails to make a speech, even to one individual; so he gave his speech in full, and then he said to the man, "I want to thank you very much. I appreciate your staying here." "Don't worry," said the remaining fellow, "my name is Young."

Dr. Vallance, I appreciate your calling on me, and I appear here representing the administration of the University. Dr. Marvin is out of town for a meeting today.

I do not have very much to say, and what I am going to say really amounts to a truism. In the Armed Forces of this country, and in our United States Army particularly, there has never been, I feel, quite so significant a situation as that which now exists. There has never been a need equal to the need today for the dissemination of learning, of knowledge, of understanding, not only understanding of the individual man or officer, but the mutual understanding of each other's problems that come from the complexities of war.

One of the main supports of that process of dissemination of knowledge is communication. Communication is an art, and the key to the art of communication is education. That is why you gentlemen have been here. It is only natural, therefore, that colleges and universities of this country should take an active interest in, and offer their services to, this educational process in the Armed Forces today, and George Washington University is most fortunate to have the opportunity of serving the United States Army through its Human Resources Research Office.

I will let you be the judge. You should be the judge, because you are the users of our commodity. I would be other than truthful if I did not say that, as the administrative officer of the University, I am personally proud of HumRRO, but that is beside the point. You have come here from your stations throughout the country to discuss these problems, and as Dr. Vallance just said, to expose the problems. You do not solve these problems dealing with human beings because there are no precise answers to most of them. Anyone who thinks that there are is liable to be a poor teacher, unless he has only one man in his class.

Now as you all return to your duty stations, we look forward with pleasure to a continuing identity of interests with you gentlemen. That is a real privilege. You have been in our midst for three days; you have wined and dined and talked with us. We hope perhaps some germ of friendship has been established, and we hope that it will grow. So in that sense, and on a slightly sentimental note, may I say on behalf of the entire University, Goodbye, Good luck, and God bless you.

(The Conference was adjourned.)

Conference Participants

Conference Participants

Abbott, Preston S., Dr.
Director of Research
U.S. Army Infantry Human Research Unit, HumRRO

Allen, M. Robert, Dr.
Educational Advisor
U.S. Army Quartermaster School

Allen, Rolfe L., Dr.
Administrative Officer, Office of the Director of Organization and Training
Office of the Deputy Chief of Staff for Military Operations, Department of the Army

Allred, Ned, Mr.
Training Officer
Army Security Agency, Department of the Army

Andregg, Neal, Dr.
Educational Consultant
The Provost Marshal General's School, U.S. Army

Andruska, B.J., Lt. Col.
Headquarters, U.S. Marine Corps

Angell, David, Mr.
Research Associate
Training Methods Division, HumRRO

Armstrong, John W., Lt. Col.
S3, United States Corps of Cadets, Department of Tactics
United States Military Academy

Baker, C.W., Lt. Col.
Operations Officer, Policy Group, Schools Branch, G3
United States Continental Army Command

Baker, Lynn E., Dr.
U.S. Army Chief Psychologist, Human Factors Research Division
Office of the Chief of Research and Development, Department of the Army

Baker, Robert A., Dr.
Senior Scientist
U.S. Army Armor Human Research Unit, HumRRO

Baron, Seymour, Dr.
Research Associate
Training Methods Division, HumRRO

Barratt, Thomas H., Col.
Commandant
U.S. Army Civil Affairs and Military Government School

Barrett, Thomas J., Col.
Chief, Technical Training Division, Directorate of Personnel Procurement and Training
Deputy Chief of Staff, Personnel, Headquarters, U.S. Air Force

Bates, W.L., Jr., Lt. Col.
Head, Schools Training
Headquarters, U.S. Marine Corps

Birrer, Ivan J., Mr.
Educational Advisor
U.S. Army Command and General Staff College

Bornstein, Harry, Dr.
Task Leader, Personnel Research Branch
The Adjutant General's Office, Department of the Army

Boyles, Julian, Col.
Deputy Commander
U.S. Army Chemical Corps Training Command

Brown, George H., Dr.
Research Scientist
Training Methods Division, HumRRO

Burke, Alvin L., Col.
Director, Department of Specialist Training
U.S. Army Signal School

Cabell, Henry B., Capt.
Assistant to Director, Academic Department
The Judge Advocate General's School, U.S. Army

Callahan, Mike B., Mr.
Head, Training Aids Section
Bureau of Naval Personnel, Department of the Navy

Canella, Charles J., Lt. Col.
Staff Officer, Human Factors Research Division
Office of the Chief of Research and Development, Department of the Army

Carr, Norman B., Mr.
Educational Consultant
U.S. Army Southeastern Signal School

Carroll, John E., Col.
Director of Training
U.S. Army Engineer School

Carstater, Eugene D., Dr.
Head, Training Research Branch
Bureau of Naval Personnel, Department of the Navy

Chandler, Burton B., Lt. Col.
Director of Research
U.S. Army Command Management School

Chandler, W.E., Col.
Director of Instruction
U.S. Army Armor School

Cisin, Ira H., Dr.
Adviser on Research Design
Director's Office, HumRRO

Colclough, O.S., Dr.
Dean of Faculties
The George Washington University

Coleman, Irving M., Lt. Col.
Director of Instruction
U.S. Army Transportation School

Collier, R.E., Lt. Col.
Assistant Director
Extension School, Marine Corps Educational Center, Marine Corps School

Copeland, Kenneth W., Lt. Col.
Chief, Training Branch
Office of the Chief Chemical Officer, Department of the Army

Crawford, Meredith P., Dr.
Director
Human Resources Research Office

Cronin, Eugene S., Lt. Col.
Chief, Individual Training Section, Training Branch
Military Personnel and Training Division, Office of the Quartermaster General, Department of the Army

Cruse, Wayne E., Dr.
Chief, Tests and Measurements Section, Office of the Deputy Assistant Commandant for Instruction
U.S. Army Artillery and Missile Center

Cummings, L.E., Col.
Deputy Assistant Commandant
U.S. Army Air Defense School

Czeh, Robert S., Dr.
Research Scientist
Training Methods Division, HumRRO

Dailey, John T., Dr.
Technical Director, Personnel Analysis Division
Bureau of Naval Personnel, Department of the Navy

Darst, H. Jackson, Dr.
Educational Advisor
U.S. Army Transportation School

Devore, Leland S., Jr., Lt. Col.
Chief, General Management Division
U.S. Army Command Management School

Dougherty, John P., Lt. Col.
Officers' Department
U.S. Army Signal School

DuBois, Donald, Dr.
Technical Advisor to the Director, Directorate of Personnel Procurement and Training
Deputy Chief of Staff, Personnel, Headquarters, U.S. Air Force

Early, Cleland E., Lt. Col.
Chief, Instructor Training Group
Marine Corps Educational Center, Marine Corps School

Evans, Ferdinand A., Lt. Col.
Director of Instruction
U.S. Army Chaplain School

Fenton, J.N., Mr.
Marine Corps Institute

Fields, Ralph R., Dr.
Professor of Education, Division of Instruction
Teachers College, Columbia University

Flanagan, Lawrence M., Capt.
Chief, Training Analysis Branch, Standards Division
Office of the Director of Instruction
U.S. Army Aviation School

Fornonzini, D.A., Major
Headquarters, U.S. Marine Corps

Foster, James L., Mr.
Educational Specialist, Evaluation Division
U.S. Army Air Defense School

Fox, Woodson W., Lt. Col.
Deputy Chief, Plans and Training Office
U.S. Army Intelligence School

Frank, Joseph, Dr.
Chief, Instructor Training Branch, Academic Services Department
U.S. Army Signal School

Fredericks, Charles G., Col.
Director, Military Psychology and Leadership, Department of Tactics
United States Military Academy

Gavin, James M., Lt. Gen.
Chief of Research and Development
Department of the Army

George, Robert B., Mr.
Educational Advisor to the Commandant for Non-Resident Instruction
U.S. Army Engineer School

Goodwin, Samuel McC., Col.
Assistant Director, Plans Division
Office of the Deputy Chief of Staff for Military Operations, Department of the Army

Gray, Charles O., Mr.
Educational Advisor
U.S. Army Ordnance School

Grigsby, Howard L., Mr.
Training and Liaison Officer
Office of the Chief of Finance, Department of the Army

Groves, Richard H., Maj.
Training Officer, Training Division, Evaluation Branch
U.S. Army Engineer School

Gueymard, Joffre L., Lt. Col.
Staff Officer, Human Factors Research Division
Office of the Chief of Research and Development, Department of the Army

Hammock, Joseph C., Dr.
Director of Research
U.S. Army Air Defense Human Research Unit, HumRRO

Harris, Frank J., Dr.
Operations Analyst
Operations Research Office

Helme, William H., Mr.
Task Leader, Personnel Research Branch
The Adjutant General's Office, Department of the Army

Herz, Robert K., Mr.
Training Aids Specialist
Deputy Chief of Staff for Military Operations, Department of the Army

Heyl, Arnold A., Mr.
Chief, Technical Services
Director's Office, HumRRO

Hicks, Fred A., Lt. Col.
Assistant Commandant
U.S. Army Language School

Hicks, Herbert C., Jr., Col.
Chief, Human Factors Research Division
Office of the Chief of Research and Development, Department of the Army

Hill, Charles W., Col.
Chief, Human Resources Research Branch, Research and Development Division
Office of the Surgeon General, Department of the Army

Hochstim, Joseph R., Dr.
Adviser on Research Design
Director's Office, HumRRO

Hoehn, Arthur J., Dr.
Senior Scientist
Training Methods Division, HumRRO

Hollis, Jesse B., Jr., Lt. Col.
Director of Instruction, Deputy Assistant Commandant for Instruction
U.S. Army Artillery and Missile Center

Holmgrain, B.E., Lt. Col.
Chief, Enlisted Group
Office of the Deputy Chief of Staff for Personnel, Department of the Army

Hoyler, H.M., Col.
Headquarters, U.S. Marine Corps

Hubbard, VanDyke, Lt. Comdr., USCGReserve
Chief, Training Section, Reserve Division
U.S. Coast Guard Headquarters

Hunter, Kelvin H., Col.
Associate Director (Army)
U.S. Naval Training Device Center

Irvin, Roy O., Col.
Director of Instruction
U.S. Army Command Management School

Irving, Glenn C., Lt. Col.
Chief, Service Schools and Replacement Training Branch, Education and Training Division
Office of the Surgeon General, Department of the Army

Jacobs, J.J., Mr.
Marine Corps Institute

Jones, Francis E., Dr.
Special Projects Officer
Director's Office, HumRRO

Jung, W.F., Lt. Col.
Executive Officer, Classification and Standards Division
Office of the Deputy Chief of Staff for Personnel, Department of the Army

Kanner, Joseph, Dr.
Chief, Audio-Visual Applications Office, Army Pictorial Service Division
Office of the Chief Signal Officer, Department of the Army

Kanter, Harold, Mr.
Educational Advisor, Officers' Department
U.S. Army Signal School

Karcher, E.K., Dr.
Group Chief, Personnel Research Branch
The Adjutant General's Office, Department of the Army

Kelly, Mary E., Maj.
Director of Instruction
United States Women's Army Corps School

Kneisel, Richard S., Mr.
Educational Advisor, Office of Assistant Commandant
U.S. Army Chemical Corps School

Kowalski, Frank, Jr., Col.
Commandant
U.S. Army Command Management School

Lally, Richard M., Maj.
Chief, Training Branch, Plans and Training Office
U.S. Army Intelligence School

Lampkin, Cline J., Col.
Chief, Plans and Training Office
U.S. Army Intelligence School

Lavell, Robert G., Lt. Col.
Director of Instruction
U.S. Army Special Warfare School

Leatherman, C.D., Dr.
Educational Advisor
U.S. Army Ordnance Guided Missile School

Leslie, Elwyn E., Jr., Maj.
Chief, Evaluation Division
U.S. Army Air Defense School

Luthi, I.L., Lt. Col.
Evaluator
U.S. Army War College

Lyon, Archibald W., Col.
Commandant
U.S. Army Transportation School

Lyons, J. Daniel, Dr.
Senior Scientist
U.S. Army Infantry Human Research Unit, HumRRO

Marks, Melvin R., Dr.
Group Chief, Personnel Research Branch
The Adjutant General's Office, Department of the Army

Marvin, Cloyd H., Dr.
President
The George Washington University

McClelland, William A., Dr.
Director of Research
Training Methods Division, HumRRO

McClure, Andrew H., Mr.
Research Associate
Training Methods Division, HumRRO

McDonough, R.C., Col.
Head, Training Section, G-3
Headquarters, U.S. Marine Corps

McFann, Howard H., Dr.
Director of Research
U.S. Army Armor Human Research Unit, HumRRO

McGay, Culbert, Dr.
Chief, Plans and Curriculum Division, Department of Non-Resident Instruction
U.S. Army Signal School

McIntyre, Charles J., Dr.
Chief, Education TV Branch
Office of Armed Forces Information and Education, Department of Defense

McMath, J.D., Capt.
Headquarters, U.S. Marine Corps

Meszar, Frank, Lt. Col.
Deputy Director of Instruction
U.S. Army Infantry School

Milton, Hugh M., II, Honorable
Assistant Secretary of the Army for Manpower, Personnel and Reserve Forces

Missar, J.C., Lt. Col.
Head, General Training
Headquarters, U.S. Marine Corps

Mitchell, Philip, Col.
Office, Director of Science
Assistant Secretary of Defense for Research and Engineering, Department of Defense

Mitnick, Leonard, Dr.
Research Associate
Training Methods Division, HumRRO

Murray, Richard F., Mr.
Educational Consultant
U.S. Army Signal Training Center

Myers, Paul A., Lt. Col.
Director of Academic Instruction
U.S. Army Information School

Nay, Randall M., Mr.
Educational Advisor
Finance School, U.S. Army

Nelson, S.J., Lt. Col.
Headquarters, U.S. Marine Corps

Newton, Henry C., Brig. Gen. (Ret.)

Patton, Calvin E., Mr.
Washington Area Representative
U.S. Naval Training Device Center

Peck, Millard, Mr.
Research and Programs Advisor
U.S. Army Strategic Intelligence School

Pickard, Edward E., Dr.
Educational Advisor
U.S. Army Engineer School

Plumb, Robert L., Dr.
Military Research Specialist on Soviet Training and Education, USSR Branch
Office of the Assistant Chief of Staff, Intelligence

Poe, Arthur C., Jr., Dr.
Educational Advisor
U.S. Army Aviation School

Porter, Henry C., Mr.
Educational Advisor
U.S. Army Armor School

Ray, Benedict, Dr.
Educational Advisor
U.S. Army Logistics Management Center

Ray, John, Col.
Chief, Plans and Research Division, G1 Section
United States Continental Army Command

Rocklyn, Eugene H., Dr.
Research Associate
Training Methods Division, HumRRO

Romanek, Henry, Maj.
Chief, Individual Training Section, Organization and Training Division, Corps of Engineers
Office of the Chief of Engineers, Department of the Army

Root, Robert T., Mr.
Research Assistant
Training Methods Division, HumRRO

Rubin, Morton A., Col.
Chief, Military Training Branch, Combat Developments and Operations Division
Office of the Chief Signal Officer, Department of the Army

Saenz, Ralph, Lt. Col.
Director of Instruction
The Provost Marshal General's School, U.S. Army

Sagner, Charles E., Jr., Capt.
Administrative Assistant, Academic Training Unit, Academic Division
Army Medical Service School, Brooke Army Medical Center

Sampson, R.A.H., Lt. Cmdr.
Head, Promotion Qualifications Section
Bureau of Naval Personnel, Department of the Navy

Schmader, Wilbur P., Lt. Col.
Deputy Director, Department of Non-Resident Instruction
U.S. Army Intelligence School

Scott, Franklin E., Col.
Director, Operations Department
U.S. Army Quartermaster School

Scott, R.W., Dr.
Senior Advisor, Education Section, Personnel Services Branch
The Adjutant General's Office, Department of the Army

Sebree, Edmund B., Maj. Gen. (Ret.)
Consultant for U.S. Army Leadership Human Research Unit
Human Resources Research Office

Segal, Julius, Dr.
Research Information Coordinator
Director's Office, HumRRO

Seitz, Clifford P., Dr.
Chief Psychologist, Army Participation Group
U.S. Naval Training Device Center

Shahan, James B., Dr.
Educational Advisor
U.S. Army Intelligence School

Shipley, Wayne D., Lt. Col.
Commandant
U.S. Army Medical Service Meat and Dairy Hygiene School

Shriver, Edgar L., Dr.
Senior Scientist
Training Methods Division, HumRRO

Siegel, Harry M., Dr.
Military Training Branch, Combat Developments and Operations Division
Office of the Chief Signal Officer, Department of the Army

Smith, Charles D., Dr.
Research Scientist
U.S. Army Air Defense Human Research Unit, HumRRO

Smith, Hobart V., Lt. Col.
Director of Training
U.S. Army Ordnance Guided Missile School

Smith, Neil G., Mr.
Educational Advisor to the Commandant
U.S. Army Signal School

Snyder, Richard, Dr.
Research Scientist
U.S. Army Leadership Human Research Unit, HumRRO

Solf, Waldemar A., Lt. Col.
Director, Academic Department
The Judge Advocate General's School, U.S. Army

Stendeback, William, Jr., Maj.
Training Officer, Training and Organization Division
Office of the Chief of Transportation, Department of the Army

Stevenson, R.H., Mr.
Curriculum Specialist, Instructor Training and In-Service Training
Bureau of Naval Personnel, Department of the Navy

Strehlow, Louis H., Lt. Col.
Chief, Education Section, Personnel Services Branch
The Adjutant General's Office, Department of the Army

Tate, Harold S., Dr.
Educational Advisor
U.S. Army Infantry School

Taylor, John D., Mr.
Education Specialist, Plans and Training Office
U.S. Army Signal School

Thorndike, Robert L., Dr.
Professor of Education, Chairman, Department of Psychological Foundations and Sciences
Teachers College, Columbia University

Vallance, T.R., Dr.
Deputy Director
Human Resources Research Office

Vance, Roger P., Ensign, USCGReserve
Educational Officer
U.S. Coast Guard Headquarters

VanEvera, B.D., Dr.
Dean of Sponsored Research
The George Washington University

Vineberg, Robert, Dr.
Deputy Director of Research
Training Methods Division, HumRRO

Vohs, Ralph H., Maj.
Combat Intelligence Branch, Organization and Training Division
Office of the Assistant Chief of Staff, Intelligence, Department of the Army

Ward, Thomas A., Col.
Traveling Consultant
U.S. Army Medical Service Meat and Dairy Hygiene School

Waters, T.W., Mr.
Head, Training Publications Section
Bureau of Naval Personnel, Department of the Navy

Weaver, David O., Dr.
Assistant Head, Training Research Branch
Bureau of Naval Personnel, Department of the Navy

Webster, Norman C., Dr.
Educational Advisor to the Commandant
The Adjutant General's School, U.S. Army

Welch, Paul, Mr.
Training Officer, Chief, Curricula Division, Department of Specialist Training
U.S. Army Signal School

Wood, C.H., Col.
Assistant Commandant
U.S. Army Chemical Corps School

Woodworth, George B., Maj.
Combat Intelligence Branch, Organization and Training Division
Office of the Assistant Chief of Staff, Intelligence, Department of the Army

Woolman, Myron, Dr.
Research Scientist
Training Methods Division, HumRRO

Wyman, Willard G., General
Commanding General
United States Continental Army Command

Zander, Eugene J., Mr.
Executive Assistant
Director's Office, HumRRO