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FACULTY PUBLICATIONS and PRESENTATIONS,

FISCAL YEAR 1980

Volume 1,

**Books, Texts, Manuals, Chapters,
Papers, Reports, and Presentations.**

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Recent publication 21

**Members of the Faculty and Staff of the
United States Air Force Academy**

Compiled by the Director of Research
Colonel M. D. Bacon
September 1980

10
WILLIAM A. ORTH, Brigadier General, USAF
Dean of the Faculty

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DEPARTMENT OF THE AIR FORCE
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I'm very happy to provide you with this outline of the Air Force Academy Faculty's Research for the Fiscal Year 1980. It combines two formerly separate documents, The Annual Research Progress Report and Faculty Publications. We hope the new format and topical index make this a more interesting and accessible document and that you'll get a clearer picture of the range of research the faculty is engaged in. We also hope that, through a slightly less formal tone, the report is more interesting and easier to read. Above all, we invite your comments, to our Director of Research, Col M. D. Bacon about the journal in general or to any of the individual faculty members with whom you have a common research interest. Thank you for your continued support.

William A. Orth

WILLIAM A. ORTH, Brig Gen, USAF
Dean of the Faculty

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CHAPTER A

Department of Aeronautics

1. BUZZELL, William A., Captain and Instructor

- a. Triangular-shaped block gauges for measuring the skin friction coefficient in turbulent boundary layers. (Research)

Capt Buzzell is involved with the development and calibration testing of triangular-shaped block gauges for measuring the skin friction coefficient in turbulent boundary layers as part of a program sponsored by the Air Force Aero-Propulsion Laboratory. Because of their small size, these devices could be used in turbo-machinery components. He will prepare a final report and will base the laboratory recommendation for further development on the results of this initial research effort.

2. GALLINGTON, Roger, W., Lieutenant Colonel and Tenure Associate Professor

- a. "An Analog Total Pressure Controller for a Blowdown Tunnel." Presented at the 53rd Meeting of the Supersonic Tunnel Association at the NASA Ames Research Center, Palo Alto, CA, Mar 26-28, 1980. (Presentation)

This paper describes the successful replacement of the manual pressure controller with an automatic analog pressure controller. The new controller reduces low frequency pressure oscillations by one order of magnitude. John Wright co-authored this paper.

- b. "Flow Quality Improvements in the USAFA Trisonic Tunnel," *Aeronautics Digest*, Fall 1979, USAFA-TR-880-7, USAF Academy, Colorado, Apr 1980. (Article)

This paper describes recent modifications which reduced the pressure fluctuations in the tunnel by a factor of three. John Wright, Stephen Icardi, and Milton Davis were co-authors.

- c. "Flow Visualization Using a Computerized Data Acquisition System." Proceedings of the International Symposium on FLOW Visualization, Bochum, Germany, 9-12 Sep 1980. (Article)

This paper, co-authored by Glynn Sisson, describes the synergistic application of wind tunnels, instruments, computers, and software to physically generate and draw pictures of complicated flows.

3. PLETCHER, John H., Jr., Major and Assistant Professor

- a. "An Analytical and Experimental Study of Aircraft Hydraulic Lines including the Effect of Mean Flow." AFAPL-TR-79-2104, Wright-Patterson AFB, OH, Air Force Aero Propulsion Laboratory, Air Force Systems Command, November, 1979. (Report)

This report describes the results of applying a mathematical model of a fluid transmission line, incorporating the effect of mean flow coupling with oscillatory flow, to predict transient behavior of an aircraft hydraulic system and selected air lines. The result of a comparison between theoretically predicted results and selected experiments indicates that the analysis provides an accurate means for fluid systems engineers to account for mean flow effects in hydraulic and air control systems.

- b. "Effects of Vibration on Clampon Transducers Used to Measure Dynamic Pressure in Hydraulic Lines. Given to the Society of Automotive Engineers, A-6 Committee, Meeting in Washington, D.C. on 24 Apr 80. (Presentation)

The clampon transducer is a transducer that clamps to the outside of the line and measures dynamic pressure without disturbing the flow. I undertook a study to determine the ability of the transducer to give reliable dynamic pressure measurements in a laboratory simulation of an aircraft hydraulic system. In this presentation I discussed factors affecting the transducer, such as vibration, temperature, clamp torque, and preload voltage. Measurements taken, in the absence of vibration, compare well with those taken by a conventional in-line transducer. But vibration is shown to affect the clampon transducer significantly. Only when vibration displacements were less than 0.001 in peak-to-peak were the dynamic pressure measurements made with a clampon transducer accurate and reliable.

4. GRIFFIN, Kenneth E., Captain and Assistant Professor

- a. "Active Control of Forward Swept Wings with Divergence and Flutter Aeroelastic Instabilities." [To be presented at the AIAA/ASME/ASCE/AHS 22nd Annual Structures, Structural Dynamics, and Materials Conference, 6-8 April 1981.] (Presentation)

The paper demonstrates a solution for the aeroelastic divergence and flutter instabilities of forward swept wings. Active control, using sensor feedback of wing motion to actuate leading and trailing edge flaps, gives a 23% increase in critical divergence and flutter speeds of two aeroelastically tailored, advanced composite, forward swept fighter wings.

5. HIGGINS, A. Michael, Captain and Associate Professor

- a. "Analysis of Catapult Test Data—The Effects of a High-G Environment" [To be published] (Article)

In this paper I compared the results of an experimental test program, which consisted of firings of actual catapults in various acceleration environments, to the predictions of an analytical catapult study previously done. The predicted trends, e.g., a significant increase in catapult pressure when the catapult was fired under "G's," did occur in the experimental data.

- b. "Ejection Catapult Computer Modeling." (Research)

The Air Force Flight Dynamics Laboratory funded this research project. The object of the work is to construct a computer model of an ejection seat catapult that would adequately predict catapult dynamics, including actual parameter magnitudes, at any level of acceleration loading. Capt Higgins will correlate these results to test data previously obtained.

- c. "Rapid Retraction and Restraint of the Human Upper Torso." Aeromedical Research Laboratory Technical Report [To be published] (Article)

This report presents the results of an experimental test program investigating rapid retraction and restraint of the human body upper torso. The objective of this research is to define design criteria for mechanisms which will automatically position and restrain air-crewmembers in an optimum body posture for safe emergency escape. The report includes data obtained from actual retractions of human volunteers as well as minimum retraction times, maximum retraction forces, and velocities. These tests demonstrate experimentally that retraction times can be reduced significantly from present USAF military specification levels.

6. JUMPER, Eric, J., Major and Associate Professor

- a. "Aerodynamic Effects of Spanwise Grooves on A Symmetrical Airfoil," *Aeronautics Digest* Spring 1980, [In publication] (Article)

This paper, co-authored by Chow, Gay, Hoffman, and Suhr, describes the results of wind-tunnel testing of a spanwise grooved NACA 0015 wing. The department sponsored the research as part of Aero 450, Aeronautical Laboratory.

- b. "An Application of an Old Principle to Teaching Viscous Flow to Undergraduates in a New Era." *Mechanical Engineering News*, [To be published] (Article)

This paper investigates the history of teaching undergraduates viscous flow and describes the approach now practiced in the Department of Aeronautics. The paper briefly describes the introductory portion of our approach in detail as well as briefly overviewing suggested follow-on topics.

- c. Laser interactions with turbulent flow. (Research)

Major Jumper served as a technical consultant to the Air Force Weapons Laboratory on laser interactions with turbulent flow. In this capacity he presented the opening paper at a workshop entitled, "Control of Turbulent, Separated Air Flow About Aircraft Turrets." His paper overviewed the magnitude of the problem as a function of laser wavelength and in terms of peak intensity on the target.

- d. "A Look at the Aeronautics Major." *The First Twenty-Five Years*, United States Air Force Academy: (Book) prepared for the Dean of the Faculty at the Air Force Academy, Colorado (1979), pp. 55-61. (Essay)

This paper reviews the development of the Aeronautical Engineering major at the Air Force Academy, specifically detailing a trend we perceive as a threat to the credibility of the major. We suggest a course of action to reverse the trend. The paper is co-authored by Daniel Daley, William Edgington, Rogert Gallington, and John Retelle.

- e. "A Model for Fluorine Atom Recombination on a Nickel Surface." *Journal of Physical Chemistry*, 84 (January 1980), pp. 41-50. (Article)

In this paper we present a new treatment for steady-state heterogeneous recombination applied to the recombination of fluorine on nickel. We include a new set of data as well as data from other publications. We feel the treatment represents a bold new approach to modeling heterogeneous chemical kinetics. Co-authors were Casper Ultee of United Technologies Research Center and Ernest Dorko of the Air Force Institute of Technology.

- f. "A New Look at the Old Problem of Altitude Derating of Air Cooled High Power Broadcast Tubes." *Heat Transfer Engineering*, [To be published] (Article)

Previously accepted design practices for the operation of high power television transmitters required that transmitters not be operated at their design output at altitudes above sea level, but at a power level less by the density ratio. Co-author, Robert Kelin (Harris Corporation) and I present a comprehensive theoretical analysis of a finned-annulus heat exchanger to show that in most practical problems heat transfer need not be derated for altitude. We present several data sets to substantiate our claim. The implications of this paper are far reaching both in terms of new transmitter designs and in terms of use of transmitters already in the field.

- g. "Scientific Investigation of the Shroud of Turin." *Applied Optics*, 19 (June 1980), pp. 1909-1912. (Article)

Co-author Robert Mottern and I introduce three articles appearing in the same issue of *Applied Optics* discussing the research findings of various tests run on the Shroud of Turin—an ancient piece of linen that bears the faint images of a man's body and which legend says is the burial cloth of Jesus of Nazareth. The paper also briefly reviews the entire range of tests performed on the cloth to investigate its claim to authenticity as well as the chemical composition of the various types of stains and images on the cloth.

h. Supersonic Drag Prediction. (Research)

Major Jumper completed work on supersonic drag prediction in May 1980. He performed this work for the Air Force Weapons Laboratory and will report on it in an open Literature Publication (see Item f above.)

- i. "Wave Drag Prediction Using a Modification of the Supersonic Area Rule." [In progress—intended for the *Journal of Aircraft*] (Article)

This paper will detail research, sponsored by the Air Force Weapons Laboratory, concerning a simplification of the supersonic area rule. The paper discusses the theory as it pertains to the simplification wind tunnel experiments used to verify the theory, a program developed to make drag predictions, and a comparison of wind tunnel results to theoretical results for an F-15 with four modifications. This paper synthesizes the ideas and work reported by Schlotterbeck ("Wave Drag Predictions on Slender Bodies of Revolution Using the Supersonic Area Rule," *Aeronautics Digest*—Fall 1978, USAFA-TR-79-1, pp. 60-75) and Harris ("Computer Wave Drag Prediction Using a Modified Supersonic Area Rule," *Aeronautics Digest*—Fall 1979, USAFA-TR-80-7, p. 25-36.

7. RETELLE, John P., Major and Associate Professor

- a. "An Investigation of Unsteady Flow Separation—Final Report." SRL-TR-80-0009, Frank J. Seiler Research Laboratory, March 1980. (Report)

This report, co-authored by Francis, Keesee, Sisson, and Lang, describes work on a combined experimental and theoretical effort to study the feasibility of generating trapping vortices on an airfoil. The report describes the instrumentation, data reduction, and results of a series of vortex generation experiments including effects on lift, drag, and moment. F. J. Seiler Research Laboratory sponsored the research.

- b. "Comparison of Towplane Performance," *Aeronautics Digest* Fall 1979, USAFA-TR-80-7, USAF Academy, Colorado, Apr 1980. (Article)

This paper presents an analysis of experimental data collected by Major Retelle and Captain Jordan of the Soaring Branch. These data provide a data base for use in the selection of the paper towplane for the USAFA Soaring Operations.

c. "Unsteady Aerodynamics." (Research)

Major Retelle continues to work in the area of unsteady aerodynamics as the principal investigator on a Seiler Laboratory sponsored program. The work is presently directed toward a comprehensive investigation of the role vortices play in dynamic stall; as such, both experimental work and theoretical work play an important role in the investigation. Associated investigations involve the exploring of methods for trapping or delaying the departure of vortices formed during dynamic stall in an attempt to exploit the apparent beneficial influence on lift. Publications

on this work are in progress.

8. SISSON, Glynn E., Captain and Assistant Professor

a. "Canard-Configured Aircraft." (Research)

During the coming year, Captain Sisson is continuing research into the aerodynamics of canard-configured aircraft. He will calibrate a seven-hole probe at compressible speeds up to Mach 1. This probe will then be capable of measuring flow field properties up to the limit of the subsonic wind tunnel. In addition, extensive software development will pioneer interactive flow field data collection techniques at the Academy. The wind tunnel operator will reduce and present data collected, in real time, using computer graphics thus allowing him to concentrate additional data collection in regions of interest. This results in large savings of time and money while improving the educational value of performing flow field surveys.

b. "Canard Wake Measurement and Description." *Aeronautics Digest*, Spring 1981, USAF Academy, Colorado [To be published] (Article)

This article presents a method for measuring, describing, and visualizing complex flow fields. The method makes use of a miniature seven-hole probe, a computer-driven traversing mechanism, computerized data acquisition equipment, and computer graphic displays. Results of three different canard wakes both numerically and graphically. Each graphical wake description consists of 8 planes of 280 points presented as axonometric and contour plots.

9. WRIGHT, John A., Major and Assistant Professor

a. "Pitot-Static Probes and Two Specially Designed Probes." (Research)

Major Wright is conducting a study in calibrating twelve standard pitot-static probes and two specially designed probes as part of a large Air Force Armament Laboratory-sponsored program. The larger program is aimed at generating a handbook similar to Abbott and Doenhoff's *Theory of Wing Section* (Dover, N.Y., 1959) to serve as a standard pitot pressure probe design guide.

10. YECHOUT, Thomas R., Major and Assistant Professor
ZOLLARS, Gerald J., Captain and Instructor

a. "Aerodynamic Data Base for Rectangular Body Munitions." (Research)

Major Yechout and Captain Zollars continue work on an Air Force Armament Laboratory-sponsored program to establish an aerodynamic data base for rectangular body munitions. Force and moment measurements were taken of various munition configurations in the subsonic tunnel with results to be published in the near future. Phase II of this project, which consists of investigating the leeside flow characteristic of rectangular munitions in the subsonic tunnel, is progressing on schedule. We have designed and fabricated a tuft grid and are currently developing a traversing mechanism with testing planned for early 1981.

b. "Experimental Aerodynamic Characteristics of Missiles with Square Cross Sections." AIAA Aerospace Sciences Meeting in St Louis, Missouri, January 1981. [To be published] (Presentation)

This paper describes the results of experimental force and moment measurements taken of various geometries, orientations, and flow conditions of rectangular munitions. We investigated a number of parameters including body cross-section corner radii, nose configurations, and fin configurations at a variety of pitch and roll orientations. We presented the effects of each of these parameters in this paper. The authors are Major Yechout, Captain Zollars of USAFA and Dr. D. C. Daniel of the Air Force Armament Laboratory.

CHAPTER B

Department of Astronautics and Computer Science

1. BECK, Norman, Captain and Instructor

a. USAFA Project Scenic Fast (Research)

This project involves flying a small self-contained payload aboard the Space Shuttle on a space-available basis. The payload is currently in the experiment design phase. I am developing experiments to include crystal growth and purification, higher order plant food production, and foam metal processing. Payload integration will begin in Spring 1981 with the flight being planned for Fall 1982.

2. BOLZ, Richard E., Captain and Assistant Professor

Also: DYE, Richard, Captain and Instructor
BOOCH, Ernest, First Lieutenant and Instructor
WOOD, Jon, Cadet Second Class

a. An Investigation Into the Programming Language ADA (Research)

ADA is the new Department of Defense high order programming language. This language was originally developed for use in embedded computer systems but will likely have a profound impact on all new DoD software within five years.

A study group has been formed in the Department of Astronautics and Computer Science to investigate the syntax and capabilities of ADA. After a period of familiarization, the group plans to provide research assistance to the Defense Advanced Research Projects Agency (DARPA) relative to the development of ADA. Current plans call for us to submit a paper to a professional journal by the end of the academic year.

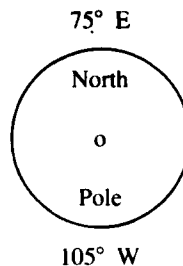
3. FARIS, Ronald J., Captain and Instructor

a. "Anti-Satellite Pellet Location" (Research)

A new area of concern is the location of Soviet anti-satellite test pellets. During the early anti-satellite tests (late 60's, early 70's) pellets were fired from behind toward targets. They were fired as pellet clouds and went into higher, more energetic orbits. I will attempt to determine where the toroidal bands of these pellets might be. Such analysis is critical as just one pellet impact could destroy portions of the Shuttle Thermal Protection System, a potentially catastrophic event for the Shuttle program.

b. "Satellite Bunching" (Research)

A geosynchronous satellite is a satellite which revolves around the earth at the same rate the earth rotates around its axis. In other words, a satellite in geosynchronous orbit appears to remain motionless over a point on the earth's surface. Because of the ellipticity of the equator, i.e.,



there are two regions 75 degrees E and 105 degrees W in which geosynchronous satellites placed there will remain there. They are stable points. A satellite placed anywhere else would want to drift to the closest point, and would take fuel to keep it in its original position. That makes locations at 75 degrees E and 105 degrees W highly desirable from a cost standpoint. In addition, the longitudes of 20 degrees W and 175 degrees E are in the middle of the Atlantic and Pacific Oceans respectively and thus are highly desirable locations for communications satellites. Because of the popularity of these four regions they are crowded with satellites. My analysis, in conjunction with that of the Aerospace Corporation in El Segundo, California, is an attempt to assign a numerical probability to the event of collision between these satellites in geosynchronous orbits. Current studies show the chance of collision between known satellites to be on the order of one in a million. Unfortunately, there is a great deal of debris in or near geosynchronous orbit which greatly increases that probability of collision and this has not been addressed in previous analyses. Considering this factor will be the thrust of our research in the near future. I will approach both projects using our computer and data from NORAD.

4. FRIEDENSTEIN, Charles D., Captain and Instructor

a. "Down-to-Earth Satellite Survivability," 1981 Air University Airpower Symposium, Maxwell Air Force Base, Alabama. (Presentation)

The U.S. military space programs stand today at a crucial juncture. We have steadily progressed to a position where we cannot conduct tactical or strategic warfare without our space resources. Although we have finally realized that this dependence makes our satellites valuable targets, we have not made substantive design changes to deal with the known threat.

This paper urges hardware action by describing some of the present threats to our satellite systems and proposing possible courses of action.

5. KRAUSE, Kenneth L., Major and Tenure Professor

Also: CARTER, Edward M., Captain and Instructor
CULBERTSON, Robert A., Captain and Instructor

a. "Computerized Test Generation System" (Research)

The purpose of the system is to allow a course director to build a data base of questions, statistics, and topical information about the questions. From this data base, a course director can automatically generate up to six

statistically equivalent versions of an exam.

6. SHEPARD, Randall, Captain and Instructor

Also: JUSTIN, Eugene, Captain and Assistant Professor
CALLEN, Thomas, Captain and Instructor
HATLELID, John, Captain and Instructor

a. "Aerospace Simulator" Major Paul Torrey, DFACS (Research)

Utilizing real time computer simulation, the following simulations are realizable:

- (1) An F-4 versus a maneuvering target.
- (2) An F-106.
- (3) An autopilot landing system.
- (4) A Space Shuttle docking problem.

Future improvements and additions include the following:

- (1) An F-16 cockpit altered to represent the Advanced Fighter Technology Integration (AFTI) version.
- (2) An improved 3-D graphics system that allows easy user modifications. This is aimed at attracting Behavioral Scientists to conduct display effectiveness studies.

Behavioral Scientists to conduct display effectiveness studies.

b. "Director Evaluation Flight Test (DEFT)" (Research)

I am performing data reduction and analysis for an instrumented F-106 testing a digital director gunsight. The gunsight utilizes sensor information to predict target position one bullet's time of flight in the future.

c. "Missile Launch Envelope Studies" (Research)

I am developing an algorithm to calculate missile launch envelopes given attacker parameters. Information concerning probability of hit is determined and displayed on the pilot's HUD.

d. "Stabilized Gun Studies" (Research)

I am developing a ground test for a trainable gun to demonstrate benefits over present fighter aircraft fixed guns.

e. "Target State Estimator" (Research)

Efforts are under way to improve the control algorithm used in the director gunsight. Present studies include target model improvements and a comparison of variable versus fixed gains.

7. SWAN, Peter, A., Major and Instructor

a. "Academy Education as an Evolution into Space Leadership." A paper to be given at the 1981 Air University Airpower Symposium at the Air War College, Maxwell AFB, AL, February 23-25, 1981. (Presentation)

The presentation will emphasize the involvement of the Air Force Space community in the development of the Academy graduate.

b. "Progress Report #1, SCENIC FAST." *Gasline*, Vol 1, No 3. (Forthcoming Report)

This report is a summary of the status of the USAFA Shuttle experiment package to be flown during the first operational flight in late 1982.

c. Qualitative vs. Quantitative Instruction for Major Systems Acquisition Management." A presentation and a paper for the 1980 National Meeting for the Operations Research Society of America and the Institute for Management Sciences, (Nov 11, 1980). (Presentation)

A discussion of the two methods of teaching management of major system acquisition. I will explain both of the techniques (lecture vs. computer simulation) with the two major advantages and disadvantages expanded.

8. WAGIE, David A., Captain and Instructor

a. "Earth's Magnetic Field Models for Dumping Momentum Magnetically on GPS Satellites." Co-authored with Lt Col Thomas J. Eller, Professor and Head, Department of Astronautics and Computer Science. Presented at AIAA/AAS Astrodynamics Conference, Danvers, Mass., on 12 Aug 80. (Presentation)

Members of DFACS have developed computer programs for reducing (dumping) unwanted reaction wheel momentum from on-orbit GPS (Global Positioning System) satellites. (See Item b. below.) These programs use the interaction of the satellite's on-board electromagnets with the earth's own magnetic field to produce a counteracting torque on the vehicle, thus reducing the reaction wheel momentum. The original computer programs used a very extensive and complex model of the earth's magnetic field to predict this interaction. This paper compared the accuracy of three much simpler earth magnetic models to the original model in predicting this torque-producing magnetic interaction. Results indicate that one of the simpler earth magnetic models will provide equally good prediction accuracy while at the same time providing a large reduction in complexity and computer processing time over the original model.

b. "Magnetic Momentum Dumping on Global Positioning System Satellites" (Research in Progress)

There are presently six Global Positioning System (GPS) satellites in orbit as part of the full-scale development test phase of the system. This system will eventually consist of 18 to 24 satellites in six different planes, and will provide users with three-dimensional positions accurate to within ten meters worldwide. These satellites use on-board reaction wheels to maintain precise satellite attitude by speeding up or slowing down to absorb unwanted momentum. Due to outside torques, however, these satellites gradually build up unwanted momentum, reaching wheel speed maximum limits about every two weeks. Members of DFACS developed computer programs which use the satellite's on-board electromagnets to decrease wheel counteracting torque. These programs produce magnetic switch times and power settings which the Satellite Control Facility at Sunnyvale AFS, California, sends to each satellite about every 10-15 days to reduce the unwanted reaction wheel momentum. Current research on these programs involves

- (1) Implementing an automatic method for selecting switch times.
- (2) Improving the method for calculating the optimum magnet settings to use at each switch time.
- (3) Adding a momentum growth factor to more accurately predict the satellite's state prior to and during the magnetic momentum dumping cycle.
- (4) Transferring real-time operational control of the programs to Rockwell International Corp. (GPS prime contractor.)

9. WITT, William P., III, Captain and Instructor

a. "Do We Need a Space Maintenance Policy Now?" Prepared for presentation at the 1981 Airpower Symposium. (Presentation)

As we speed toward an important place for space operations, we have neglected the logistics needed to sustain operations in space. This paper examines the background and requirements needed to establish a workable maintenance policy for space.

b. "Nonlinear Analysis of Laminated Composite Plates." To be presented at the International Symposium on Mechanical Behavior of Structural Media, Ottawa, Canada, 18-21 May 1981. (Presentation)

I have co-authored this paper with Dr. A. N. Palazotto, AFIT. Normal shear has a large effect on the behavior of laminated composites, and this effect increases as displacements become large. We have developed a finite-element which includes normal shear. Using this element, laminated composite plates can be analyzed as they experience large displacements.

CHAPTER C
Department of Behavioral Sciences and Leadership

1. CANNON, Ross A., USAFA Cadet
SCHWANK, Jock C. H., Lieutenant Colonel and Tenure Professor

- a. "Effect of Alternate Instrument Displays on Novice Pilots." *Proceedings: Seventh Symposium on Psychology in the DoD*, April 1980, United States Air Force Academy, CO. (Article)

This paper presented at the Symposium, reports on a series of experiments using cadet pilots flying a light aircraft simulator. In particular, we were interested in their ability to use lights in the visual periphery to maintain aircraft heading. We also investigated the differences in simulator flying ability between male and female cadets and found only very slight differences.

2. DANSBY, Mickey R., Captain and Assistant Professor

- a. "BCT Attrition." (Presentation)

This is a briefing presented to the Superintendent, Dean and Commandant on BCT Attrition, focusing on the Class of 1984 at USAFA. I looked at historical trends in attrition, compared male and female attrition, and compared the Classes of 81-84. For these classes, I looked at daily attrition during BCT and correlated attrition with other information on a daily basis. Hard copies of the briefing are available for those who are interested.

- b. "Changes at USNA that May be Related to Reduced Attrition." (Presentation)

I have made this presentation several times at USAFA during the Spring of 1980. It summarizes the findings of the Attrition Research Task Force, of which I am a member, in their in-depth evaluation of what factors may relate to the significant reduction in student attrition at the Naval Academy in recent years. The results are presented in a unique tabular form, which readily points out significant factors. Copies are available from me or from RRE.

- c. "Leader Effectiveness as a Function of Leader's Sex and Leadership Style." *Proceedings: Seventh Symposium on Psychology in the DoD*, April 1980, United States Air Force Academy, CO. (Presentation)

I presented this paper at the Symposium and published it in the proceedings. I summarized the results of my dissertation, in which I investigated the effectiveness of men and women leaders using different leadership styles with different kinds of tasks. This was an experimental investigation in which men and women were assigned randomly to leader or follower positions in small, mixed-sex groups. The leaders were instructed in using either a structuring leadership style or a non-directive style. All groups worked on two tasks, one verbal and the other motor. As it turned out, with these college students, sex of leader was not an important determinant of leader effectiveness. However, the structuring style was most effective for both men and women leaders while working on the motor task.

- d. "Reasons for Attrition at USAFA." (Presentation)

I have made this presentation several times at USAFA during the Summer of 1980. It is the result of the investigation by the Attrition Research Task Force. I correlated and summarized numerous sources to develop an integrated picture of what may be reasons for attrition at USAFA. The printed report is the most comprehensive summary of attrition research for USAFA available. It may be obtained through RRE.

3. HENDERSON, George, Distinguished Visiting Professor

- a. "Physician-Patient Communication." Springfield, Illinois: Charles C. Thomas (forthcoming 1981). (Book)

I have attempted to combine within a single volume the most definitive studies focusing on effective communication techniques for health care professionals in general and physicians in particular. In addition to presenting a behavioral sciences overview, I suggest strategies for minimizing cultural blockages.

- b. "Police Human Relations." Springfield, Illinois: Charles C. Thomas (forthcoming 1981). (Book)

With perhaps more courage than humility, I discuss American police officers from multidimensional perspectives: psychological, sociological and organizational. Implicit throughout the text is the thesis that the resultant "whole" officer leaving a police academy is considerably greater than the initial "parts" which comprise the recruits. Using the analogy of the socialization process of military officers, I discuss ways in which police supervisors can reduce stress, burnout, and organizationally dysfunctional behavior. Of course, the latter includes racism, sexism, and brutality.

- c. "Transcultural Health Care." Menlo Park, California: Addison-Wesley (forthcoming 1981). (Book)

As the concept of holistic medicine (physiological and psychological) gains in popularity, it is clear that a few health and allied health training schools either understand or teach effective techniques for training Third World patients/clients. Martha Primeaux, R.N. and I used nursing as the profession on which we build a foundation for a transcultural health care model. The sections pertaining to folk medical beliefs and practices as well as those offering patient care tips should have application beyond the nurse-patient relationship.

4. JACKSON, Linda D., Captain and Instructor
HUGHES, Richard L., Major and Assistant Professor
BERRY, Gene A., Lieutenant Colonel and Assistant Professor

- a. "Brain Lateralization and Simple vs. Integrated Task Performance." *Perceptual and Motor Skills* (in press). (Article)

There has been a preponderance of right handers across time and cultures since *Australopithecus*. That suggests some evolutionary advantage of right-handedness. However, most studies fail to note any cognitive deficits associated with left-handedness. Why is there a preponderance of right handers if there is no advantage to right-handedness? We looked for an answer to this question in the lateralization of the human brain, which for right handers means control of verbal functions primarily in the left cerebral hemisphere. Left handers, however, are different in that their verbal and spatial abilities are not as lateralized or specialized in one or the other hemisphere. This difference between right handers and left handers suggests a cognitive disadvantage for left handers when verbal and spatial tasks must be performed simultaneously. Since the control centers for these functions are less distinct in left handers, there should be more interference between them and, hence, poorer performance of multiple simultaneous tasks. That is precisely what the authors found. There were no differences between right handers and left handers on either spatial or verbal tasks performed singly, but the performance of left handers dropped significantly (relative to right handers) when spatial and verbal tasks had to be done simultaneously. On all the tasks, we found a slight sex difference with males consistently doing slightly better.

5. KOONCE, Jefferson M., Lieutenant Colonel and Tenure Professor

- a. "Air Force Academy Cadet Interest in Flying Specific Aircraft." U.S. Air Force Academy, CO: Technical Report USAFA-TR-80-13, April 1980. (Report)

These are the results of a survey of all pilot-qualified cadets in the Class of 1979 who are presented with questions regarding which aircraft they would prefer to fly, which aircraft they would least like to fly, what did they expect to fly after pilot training, and what they would like to fly on a long-term or career basis. The data indicates that the Air Force should be seriously concerned with its plans for manning its strategic forces in the future. Of 524 cadets, 357 did not want B-52s. SAC aircraft were the least preferred type of plane.

- b. "A Reliable, Inexpensive, and Flexible Instrument for Performance Measurement." (Presentation)

This paper, presented to Division 21 of the American Psychological Association, investigates the utilization of human observers in the recording of pilot performance in a variety of maneuvers. It compares these measures with computer-recorded performance in terms of cost, reliability, and flexibility.

- c. "A New Breed of Cat: The Human Factors Revolution." U.S. Air Force Movie TS-880. (Movie)

This movie, made by the Audio-visual Services of the Air Force, Norton AFB, defines the field of human factors engineering, shows many of the applications of this discipline, visits many of the research facilities, and tells of present research and future opportunities in the field. (27 minutes, color, sound.)

- d. BECKER, R. J., WILLIGES, B. H., WILLEGES, R. C., and KOONCE, J. M. "Prediction of Performance in Motor Skills Training." 23rd Annual Meeting of the Human Factors Society, Boston, Massachusetts, October 1979. (Presentation)

- e. KOONCE, J. M. and BERRY, G. A. "U.S. Air Force Academy Male and Female Cadet Comparisons in the Prediction of Psychomotor and Basic Flight Skills." *Proceedings: Seventh Symposium on Psychology in the DoD*. U.S. Air Force Academy, CO, April 1980. (Presentation)

- f. KOONCE, J. M. and MCCLOY, T. M. "Sex Differences in the Acquisition of Flying Skills." Division 19 of the American Psychological Association Annual Meeting in Montreal, Canada, September 1980. (Presentation)

This series of studies (d, e, f, and g), sponsored by AFOSR, looked first at the differences between USAF Academy male and female cadets, in comparison with male and female students at Virginia Polytechnic Institute and State University, and compared the differences in ability to predict their performances on basic psychomotor tests and form basic flight maneuvers. Then we looked further into the roles of cognitive versus motor factors involved in the acquisition of basic flying skills. All subjects were trained to a preset criteria on the performance of four basic flight maneuvers and then were taught to perform chandelles to determine the extent to which the training on basic maneuvers transferred to the more complex and cognitively demanding chandelle.

- g. KOONCE, J. M. and MCCLOY, T. M. "Cognitive Styles and the Acquisition of a Complex Aerial Maneuver," 24th Annual Meeting of the Human Factors Society, Los Angeles, CA, October 1980. (Presentation)

h. KOONCE, J. M. "Validation of a Proposed Pilot Trainee Selection System." *Proceedings: Seventh Symposium on Psychology in the DoD*. U.S. Air Force Academy, CO, April 1980. (Presentation)

A pilot selection program consisting of the AFOQT and a psychomotor skills test was proposed in lieu of T-41s as a screening device for Undergraduate Pilot Training (UPT). I administered these tests to 129 members of the Class of 1978, 286 in the Class of 1979, and 789 in the Class of 1983. This paper presents the test performance of the cadets in the Class of 1978 with their subsequent performance in UPT. The results shed serious question on the validity of the proposed screening system when applied to Academy cadets.

6. MICKLEY, G. Andrew, Captain and Assistant Professor

a. "Antihistamine Radiation Protection is Dissimilar from Estrogen Radiation Protection." *Proceedings: Seventh Symposium on Psychology in the DoD*, April 1980, U.S. Air Force Academy, CO. (Presentation)

Both estrogens and antihistamines protect experimental animals from some of the effects of ionizing radiation. This study suggests that the physiological mechanisms behind the radiation protection offered by the two chemicals is dissimilar.

b. "Behavioral and Physiological Changes Produced by a Supralethal Dose of Ionizing Radiation: Evidence for Hormone-Influenced Sex Differences in the Rat." *Radiation Research*, (1980). (Article)

Females are less affected by ionizing radiation than are males. This appears to be due to the high levels of estrogens present in specific areas of the brain of the female.

c. TEITELBAUM, H., GIAMMATTEO, P. and MICKLEY, G. A. "Differential Effects of Localized Lesions of N. Accumbens on Morphine-and-Amphetamine-Induced Locomotor Hyperactivity in the C57BL/6J Mouse." *Journal of Comparative and Physiological Psychology*, 1979, 93, 745-751. (Article)

Although morphine and amphetamine both enhance locomotor activity in this strain of mouse, this hyperactivity is mediated by different brain areas depending on which drug is administered.

d. ALTER, W., MICKLEY, G. A., CATVAVS, G., MUELLER, G., KIEFFER, V., DOYLE T. and KOUSKI, A. "Role of Histamine and Beta Endorphin in Radiation-Induced Hypotension and Acute Performance Decrement in the Rat." *Aviation, Space and Environmental Medicine Meeting*, 1980. (Presentation)

Morphine-like substances can be identified in the blood of rats after they are exposed to ionizing radiation. These substances (endorphins) produce a behavioral incapacitation which can be overcome with a drug which is antagonistic to opiates.

e. MICKLEY, G. A., and TEITELBAUM, H. "Postirradiation Hypotension Fails to Predict Behavioral Incapacitation." *Radiation Research Society Meeting*, 1980 (Presentation)

Some believe that extremely low blood pressure is what causes the behavioral incapacitation seen after ionizing radiation exposure. This paper reveals the fact that hypotension can occur without decrements in behavior and that hypertension does not protect experimental animals from postirradiation incapacitation.

f. MICKLEY, G. A. and TEITELBAUM, H. "Yohimbine Blocks Lateral-Hypothalamic-Mediated Behaviors." *European Journal of Pharmacology*, 1979. (Article)

I used a state-of-the-art technique (C14 D-Oxyglucose autoradiography) to demonstrate that the drug yohimbine has its specific behavioral effects by working in the hypothalamus.

7. WILLIAMS, John W., Colonel and Permanent Professor.

a. "The Integration of Women into the Air Force Academy: An Update." *Proceedings American Psychological Association Annual Meeting*, New York, 1980. (Presentation)

I tried to point up the most salient findings of a four-year longitudinal research effort on attitudes and behaviors of men and women cadets as they proceeded through the Academy experience. Male cadets are becoming more accepting of females as cadets and believe they ought to be here; however, they still do not accept the idea of women as combat leaders. Women cadets also question their role as future combat leaders. Male cadets still say they prefer a "traditional" style of marriage. Female cadets who are engaged or going steady tend to be involved with male cadets rather than civilian males.

b. HUNTER, E. J., DEN DULK, D., and WILLIAMS, J. W. "The Literature on Military Families: 1980. An Annotated Bibliography." USAFA-TR-80-11. (Bibliography)

This annotated bibliography summarizes 450 publications on the military family. Included are such subjects as divorce, dual-career military families, single-parent families, families of POWs, family stress, effects of separation, the trauma of PCS and TDY, retirement problems, comparison of military and civilian children, and families overseas.

8. WOOD, Frank R., Captain and Instructor

a. "Air Force Junior Officers: Changing Prestige and Civilization." *Armed Forces and Society*, 6, No. 3 (Spring 1980). (Article)

The trend toward civilianization continues! Among Air Force children, and families overseas.

8. WOOD, Frank R., Captain and Instructor

a. "Air Force Junior Officers: Changing Prestige and Civilization." *Armed Forces and Society*, 6, No. 3 (Spring 1980). (Article)

The trend toward civilianization continues! Among Air Force junior officers, the uniquely military function of the Air Force, flying, is declining in importance while that of management is increasing. The outstanding consequence of this changing professional prestige is that officers of all specialties are redefining themselves in civilian terms and establishing closer ties with civilian counterparts than contemporaries in the officer corps. In a sense, the profession itself is experiencing an identity crisis, and one cost is a high rate of attrition.

CHAPTER D Department of Biology

1. BIRKNER, John H., Lieutenant Colonel and Associate Professor

a. "Genetics Literature Review." (Research)

This project is an on-going effort in the Department of Biology. The project requires the collection and analysis of information on the worldwide progress of recombinant DNA research (genetic engineering). The emphasis during the past year has been the collection of information on "technology transfer," the extent to which foreign countries are being supplied with U.S. know-how in genetic engineering. The Defense Intelligence Agency sponsors and funds this effort.

2. BUTLER, William D., Captain and Assistant Professor

a. "Depleted Uranium." (Research)

The A-10 aircraft has been especially designed for close air support. Part of its effectiveness is due to the depleted uranium munitions used against enemy tanks. Captain Butler's research effort attempts to determine toxic effects (if any) of depleted uranium from these munitions on mammalian systems. He used electron microscopy to assess possible changes in tissues of rats exposed to depleted uranium. The Air Force Armament Testing Laboratory (Air Force Systems Command), Eglin AFB sponsored and funded this project.

3. CAIRNEY, William J., Major and Associate Professor

a. "The Effect of Hyperbaric Oxygen on the Growth of *Mucor* sp. and *Aspergillus fumigatus*." FJSRL-TR-80-004. Frank J. Seiler Research Laboratory, USAF Academy, CO, February 1980. (Technical Report)

This publication deals with the effect of hyperbaric oxygen (oxygen under high pressure) on two mycotic disease agents. Major Cairney isolated both of the organisms investigated in this research from the human lung and determined growth rates for these pathogens under various hyperbaric oxygen levels. Both organisms showed inhibited growth at oxygen levels well tolerated by humans. This suggests that the compression chamber facilities currently operated by the Air Force might be effective in treating diseases caused by these organisms. The Department of Biology currently maintains an active research program in the field of hyperbaric oxygen therapy and mycotic disease agents.

b. "Herbicide Orange Site Treatment and Environmental Monitoring: Summary Report and Recommendations for Naval Construction Battalion Center, Gulfport, Mississippi." OEHL-TR-79-169. USAF Occupational and Environmental Health Laboratory, Brooks AFB, Texas. November 1979. (Technical Report)

Major Cairney co-authored this report with Major Alvin L. Young, Epidemiology Laboratory, USAF School of Aerospace Medicine, and Lt Colonel Charles E. Thalken, USAF Occupational and Environmental Health Laboratory. They prepared it to present senior Air Force leaders the latest available data in the continuing environmental monitoring studies of a 12-acre storage area on the Naval Construction Battalion Center (NCBC), Gulfport, Mississippi. The area had been used for the long-term storage of approximately 840,000 gallons of Herbicide Orange from mid-1968 to mid-1977. Since 1972, the Biology Department has actively assisted Air Force

agencies in determining the effects of Herbicide Orange and its associated dioxin in several ecosystems worldwide. Current research is on biochemical characterization of bacteria associated with massive herbicide spills.

c. "Problems Associated with Meaningful Research on the Effects of Hyperbaric Oxygen on Mycotic Disease Agents." USAFA-TR-80-4. Department of Chemistry and Biological Sciences Report. USAF Academy, Colorado. February 1980. (Technical Report)

This technical report represents an extensive review of literature on previous work in the area of oxygen toxicity limits of mycotic disease agents. Major Cairney defined several problem areas including questionable reliability of past research results and controversies over the identification of the organisms actually used in the research. Realization of these problems is critical for any medical microbiologist or mycologist who might want to become involved in this area of research.

d. "Project PHENIX." (Research)

Project PHENIX is a program conceived by the Medical Service Center (AFMSC/SGPA, Brooks AFB) to study Psychophysiological, Human, Environmental, and Investigative factors (X) as they relate to tactical air operations. The purpose of the project is to get an overall impression of stressing factors present (and perhaps inherent) in an intense operational setting. The setting selected for this study was the Rapid Deployment Force Exercise (Red Flag) at Nellis AFB. As a result of this study, several operational factors (especially if taken together) have been identified as compromising aircrew safety.

4. COULTER, Gary R., Major and Associate Professor

a. "Identification of a Cell-Associated Morbillivirus from Cattle Affected with Malignant Catarrhal Fever: Antigenic Differentiation and Cytologic Characterization." *American Journal of Veterinary Research*, 40(12): 1667-1677. December 1979. (Article)

Major Coulter co-authored this publication with Dr. J. Storz, Department of Microbiology, College of Veterinary Medicine and Biomedical Sciences, Colorado State University, Fort Collins, Colorado. Malignant catarrhal fever (MCF) is a fatal disease affecting cattle and various other ruminants throughout the world. It occurs only sporadically in the United States although several serious outbreaks have been reported. The research Coulter and Storz conducted was directed at identification and characterization of the viral agent causing the disease. They identified the virus, isolated from a natural case of MCF, serologically and cytologically as a morbillivirus, the first virus of this type ever reported in association with North American cattle. Its role in the etiology of MCF requires further study.

5. GASEOR, Randal A., Captain and Assistant Professor

a. "The Use of Sequentially Treated Lagoon Effluent for Turf Irrigation." Technical Report, U.S. Army Corps of Engineers, Cold Regions Research and Engineering Laboratory, Hanover, New Hampshire. November 1979. (Report)

This report deals with the nutrient removal capability and wastewater renovative capacity of deep (> 4 meters) wastewater irrigation holding lagoons located at the USAF Academy. The Department of Biology has for several years had a project on the environmental effects of using sewage effluent water for irrigation of golf courses, parade fields, and median strips. We are currently evaluating the practice of sequential lagooning for water quality improvement. The report includes specific recommendations for the evaluation of wastewater irrigation of turf grasses grown in the semi-arid environment. The U.S. Army Cold Regions Research and Engineering Laboratory,

Hanover, New Hampshire sponsored and funded the project.

6. RIPLEY, J. Douglas, Captain and Assistant Professor

a. "Occupational and Environmental Health." (Consulting)

Captain Ripley assisted the USAF Occupational and Environmental Health Laboratory (OEHL) teams in assessing the environmental effects of the Space Shuttle Program. He also helped develop a bioassay technique using plants to determine contamination levels (e.g., fuel and pesticide spills) in soil.

7. TOOLE, Joseph E., Captain and Instructor

a. "Bird Population Study in the West Monument Creek Area of USAFA." (Research)

The purpose of this project is to establish a research site on the USAFA reservation for assessing bird population over a long-term period. Present plans are to have cadets actively involved in this research via the Bio Sci 499 Independent Study course. Several subsequent projects are anticipated. These include the assessment of small animal populations and the correlation of plant types with animal species. This entire effort is part of a major Front Range animal population study sponsored and funded by the Denver Museum of Natural History.

8. WEBB, James T., Major and Assistant Professor

a. "Glutamine Synthetase: An Assimilatory Role in the Liver as Related to Urea Retention in Marine Chondrichthyes." *Science* 208: 293-295, 1980. (Article)

Major Webb co-authored this publication with Dr. G. W. Brown, Jr., of the University of Washington. This article presents the latest information on the enzymes of glutamate and glutamine metabolism. Glutamate, an excitatory neurotransmitter, combines with ammonia to form glutamine, by enzymatic action in the brain. The researchers will investigate the metabolic recycling of glutamate and its connection with glutamine in the bovine brain with enzymological methods. The overall goal of the project is to identify the metabolic pathway of recycling glutamate and other neurotransmitters.

b. "A Survey of Glutamine Synthetase Activities in Tissues from Three Classes of Fish." USAFA-TR-80-10. Department of Biology, USAF Academy, Colorado. September 1980. (Research)

Enzyme assays using the γ -glutamyl transferase method provided estimates of glutamine synthetase activity in tissues from eighteen species of fish. These species included Chinook salmon, Pacific herring, carp, channel catfish, Pacific hagfish, spiny dogfish, copper rockfish, Pacific cod, fresh-water and salt-water stingray, and Pacific lamprey. Glutamine synthetase activity in the liver and kidney from the classes Chondrichthyes, Cyclostomi and Osteichthyes provided data on each species' needed for glutamine.

9. WISNER, Mark E., Captain and Instructor

a. "An Analysis of Pantothenic Acid as A Stress Vitamin in Rats." (Research)

Pantothenic acid was first discovered in 1933 and found to be essential for human metabolism. Pantothenic acid is present in almost all food items and a recommended daily intake has been established. The goal of this project is to

determine the role of pantothenic acid in the ability of laboratory rats to adapt to physical, thermal, and dietary stress.

CHAPTER E

Department of Chemistry

1. BRAYDICH, Michael D., Captain and Instructor

a. "Calibration of a Chloride Ion Probe in Strong Peroxide-Hydroxide Solutions." Presented at the Air Force Office of Scientific Research Molecular Dynamics Conference, Hanscom AFB, MA, 8-10 Oct 1980. (Presentation)

A chloride ion probe is an important tool in the study of the chemical generation of excited oxygen with chlorine and basic hydrogen peroxide. This tool is only useful if the validity of its measurements is established. The study described here characterized the probe and determined the conditions required for valid measurements.

2. DYMEK, Chester J., Jr., Major and Associate Professor

Also: MYERS, Lee E., Lieutenant

DAVIS, Larry P., Captain

LENGENFELDER, Douglas, Lieutenant

a. "Chemical Generation of $O_2(^1\Delta)$." Presented at the Air Force Office of Scientific Research/Frank J. Seiler Research Lab Molecular Dynamics Conference; USAFA, CO, 3-5 October 1979. (Presentation)

This paper describes studies of a chemical generator of excited oxygen, $O_2(^1\Delta)$, based on the reaction of chlorine gas (Cl_2) with basic hydrogen peroxide (H_2O_2). $O_2(^1\Delta)$ is the fuel for the high energy oxygen-iodine transfer laser being developed at the Air Force Weapons Lab. The studies concentrate on reaction parameters (such as the pH, temperature, and concentration of chloride ion in the reaction solution) and pressure and percent of $O_2(^1\Delta)$ in the output of the reactor.

b. "Chemical Generation of $O_2(^1\Delta_g)$. II. FJSRL Technical Report 80-0018, August 1980. (Report)

Co-authors: Lt L. E. Myers, Lt D. Lengenfelder, and Capt Larry P. Davis

This article is a detailed presentation of the results of the research on the chemical reaction used to generate $O_2(^1\Delta)$. It also describes the effects of surfactants in the reaction mixture and use of alternative reactants, such as chlorine monofluoride, on the efficiency of the reactor in $O_2(^1\Delta)$ production.

c. "Comparative Experimental and Theoretical Studies of the Chemical Generation of $O_2(^1\Delta)$." Presented at the Air Force Office of Scientific Research Molecular Dynamics Conference, Hanscom AFB, MA, 8-10 October 1980. (Presentation)

Co-authors: D. M. Storch, L. P. Davis, and M. Cummings.

The experimental part of these studies focuses on the dependence of the percent $O_2(^1\Delta)$ output from the chemical generator on the method of pre-mixing the reactant base and hydrogen peroxide. The effect of the presence of chloride ion in the reaction mixture is also studied. The theoretical studies deal with the calculation of molecular geometries and energies of species involved in proposed mechanisms for the chemical production of $O_2(^1\Delta)$.

d. "Comparison of Br_2 and Cl_2 in production of $O_2(^1\Delta_g)$ by Reaction with Basic Hydrogen Peroxide." Presented at the American Chemical Society Meeting-in-Miniature, Denver, CO, 3 May 1980. (Presentation)

Co-authors: CIC Link and CIC B. Funke.

The key point made in this paper is that percent of O_2 ($^1\Delta_g$) in the chemical generator output decreased by a factor of two to three when bromine (Br_2) gas is substituted for chlorine (Cl_2) in the reaction.

3. FANNIN, Armand A., Jr., Lieutenant Colonel and Tenure Professor

- a. "Conductivities of $AlCl_3$ -Rich Molten $AlCl_3$ - $LiCl$ Mixtures." *Journal of the Electrochemical Society* 126, 1650 (1979). (Article)

Co-authors: Ronald A. Carpio, Lowell A. King, and Fred C. Kibler.

A mixture of the molten chlorides of lithium and aluminum is a candidate electrolyte for low temperature molten salt batteries of the type used in several types of weapons and knowledge of the electrical conductivity of the electrolyte is a critical factor in the design of such a battery. The conductivity of this mixture is measured for wide ranges of composition and temperature. We give the results in an equation of the form-specific conductivity as a function of composition and temperature.

4. FLOM, Elroy A., Captain and Assistant Professor

- a. "A Geochemical Method for Determining Heat History of Retorted Shale Oil." FJSRL TR-80-0014, June 1980. (Report)

Co-author: 2Lt Stephen J. Thompson

Information about chemical geology is preserved in biochemical molecules which survive in oil shale deposits. Some of these molecules are porphyrins (ring structures containing carbon, hydrogen, oxygen, nitrogen and various metals). Porphyrins sometimes are indicators of the heat history of the oil derived from oil shale. The report provides a method for analyzing shale oils to determine the ratios of different porphyrin types and their mass spectral data.

5. MOODY, Harvey W., Captain and Associate Professor

- a. "The Evaluation of the Parameters in the Van Deemter Equation." *Journal of Chemical Education* (Approved for Publication) (Article)

The Van Deemter Equation describes the resolution or efficiency of separating chromatographic peaks in gas chromatography. This article describes several ways by which quantitative information concerning the three constants in the equation may be evaluated. Knowledge of these constants' magnitude can help you select the best column for a given analysis.

6. MUEH, Hans J., Major and Associate Professor

- a. "The Evolution of the Discipline—25 Years of Chemistry and Biological Sciences," in *The First Twenty-Five Years*, United States Air Force Academy, CO 1979. (Essay)

The chapter deals with the history and development of educational philosophy during 25 years of department evolution.

7. SCHILLER, Harvey W., Colonel and Permanent Professor

a. "The First Twenty-Five Years," United States Air Force Academy, CO, 1979. Editor, Basic Sciences Division. (Essay)

The essay deals with historical and philosophical perspectives on the development of the Air Force Academy.

8. STORCH, Donn M., Captain and Instructor

See DYMEK, Chester J., Jr.

9. WATRAS, Ronald E., Major and Associate Professor

a. "Energy and the Environment." (Workshop)

Presented a workshop on energy and the environment and presided over a session on energy and the environment at the 28th National Science Teachers Association convention and 1st Annual Meeting of the Society of College Science Teachers, Anaheim, CA 21-14 March 1980.

We held two sessions with science teachers throughout the country concerning the energy problem and we discussed national energy and environmental policy decisions. Participants learned more about the complex relationships among energy demands, energy supplies, and environmental pollution.

"Energy-Environment Workshops." (Article)

C/O Colorado is a monthly publication for the purpose of uniting and informing Coloradoans who care about issues confronting the quality of life in Colorado and the world; (*C/O Colorado*, LaPorte, CO), Vol 1, Aug 1979.

This article is a description of the Citizens' Workshops on Energy and the Environment program conducted at the USAF Academy for the State of Colorado. The program has three parts: a slide orientation or movie dealing with the basic facts related to the energy problem; a decision-making game played by participants using the Energy-Environment Simulator; and a feedback session where we discussed questions raised by the program.

b. "Fossil Fuels in Perspective." (Article)

C/O Colorado, is a monthly publication for the purpose of uniting and informing Coloradoans who care about issues confronting the quality of life in Colorado and the world; (*C/O Colorado*, LaPorte, CO), Vol 1, Oct 1979.

Most of the energy we use today comes from burning fossil fuels. However, our minds cannot imagine the hundreds of millions of years that nature needed to produce these fossil fuels. To get a better feeling for this time scale we have compressed the last 1,000 million years of our planet into one calendar year.

c. "Summer Institute in Energy Development and Public Policy for Educators." (Workshop)

Participant at Energy Institute sponsored by the Department of Energy and the University of North Dakota, Bismark, ND, 9-16 June 1980.

The Institute helped prepare participants for teaching strategies about the socioeconomics, geology, and ecology of energy development and related public policy issues at the national and state level. We gave special attention to

problems associated with lignite coal and coal gasification.

10. WYNN, Thomas F., Captain and Instructor

Also: L. Vaughn

J. D. Bradshaw

J. N. Bower

J. D. Winefordner

a. "Wavelength Modulated, Continuum Source Excited, Furnance Atomic Fluorescence Spectrometric System for Wear Metals in Jet Engine Lubricating Oils. *Anal Chim Acta* (In press) (Research)

This research is in support of the USAF Spectroscopic Oil Analysis Program (SOAP). The purpose of SOAP is to predict mechanical failures in jet aircraft engines by monitoring the wear-metal content in the lubricating oil. The authors investigated a new system for the analysis of wear-metals with attention to metals difficult to determine with systems currently employed. The Air Force Office of Scientific Research supported the research.

CHAPTER F

Department of Civil Engineering

1. CHISOLM, Stoney P., Major
VAN SAUN, Richard, Captain

- a. "Ground Motion Induced Tension Spall in Soils." Sponsored by Air Force Weapons Laboratory, Kirtland AFB, NM. (Research)

Tension spall is the physical separation of originally intact near-surface material under tensile stresses created by a stress wave interaction with the air-ground interface. Such a phenomenon is likely to occur as a result of surface or near-surface nuclear detonations and may play a significant role in the resulting ground motions in the vicinity of land-based strategic weapon systems. The major effect seems to be the creation of low frequency, large displacement ground motions at ranges that might otherwise see negligible motions.

In an attempt to better understand tension spall and its effects, we are analyzing ground motion data from several Defense Nuclear Agency-sponsored high explosive simulation tests in order to (1) identify spall-related ground motion phases; (2) determine the depth and extent of the resulting spall separation; and (3) determine the influence of geology, source configuration, and yield on tension spall.

The results of this investigation may play a significant role in the development of an analytical model capable of predicting the depth and extent of tension spall in soils due to high explosive or nuclear-induced ground motions.

2. CORNELIUS, Kenneth A., Captain
BENSON, Joel D., Major
RIGGS, Gregory D., Captain

- a. "The Continuing Performance of the USAF Academy Retrofit Solar Test House," has been tentatively approved for presentation to the Third Annual Systems Simulation Economic Analysis/Solar Heating and Cooling Operational Results Conference (sponsored by the American Society of Mechanical Engineers) to be held in Reno, Nevada, 27 April - 1 May 1981. (Presentation)

- b. "Final Interim Technical Report on USAFA Solar Test House," ESL Technical Report 80-34, July 1980, Air Force Engineering and Services Center. (Report)

- c. "Solar Test Home." We turned the Solar Test Home back to the control of the Base Civil Engineer on schedule on 30 September 1979 and removed and redistributed all research instrumentation according to directions from the sponsoring agency. We have devoted the last year to preparation of the final technical reports and to familiarizing the civil engineering maintenance forces with their responsibilities in operating the system. (Research)

- d. "The USAFA Solar Energy Research Project Summary Report," ESL Technical Report 80-35, July 1980, Air Force Engineering and Services Center. (Report)

3. EWING, Mark S., Captain

- a. "Turbine Engine Bladed Disk Dynamics." (Research)

I performed preparatory research on bladed disk dynamics in advance of my entry into the doctoral program at Ohio State University.

4. GERARD, Thomas A., Captain, USA

a. "A Primer on the Interpretation of Dynamic Structural Response Data." (Research)

The purpose of this research is to develop a primer to assist new AFWL project engineers in analyzing the response of current and future weapons systems' protective structures. Derivation of basic formulas and theory and explanations of various solutions of shock response spectra, Fourier Expansion, and Power Spectral Density, using examples with known solutions, will remove current response data analysis from "black box" techniques and promote a solid understanding of the basic underlying principles. Sponsored by the Air Force Weapons Laboratory, Kirtland AFB, NM.

5. HANES, Richard, M., Major
BARTEL, H. Dean, Major
STEINFELD, David D. Second Lieutenant

a. "Dynamic Response of a Seismically Stable Platform (ISOPAD)." (Research)

Major Hanes and Lieutenant Steinfeld have directed their initial research efforts primarily toward gaining experience in the use of computer software in the dynamic analysis of simple structures. They have used the SDRC MODAL-PLUS program to extract the natural frequencies and generate mode shapes of simple beam and plate structures. He has conducted preliminary experiments on the USAFA ISOPAD, including the generation of mode shapes for individual parts of the pad. Complete structure testing is to begin in October.

Major Bartel has been a consultant to the 6585th Test Group on a contract to develop a prototype isolation pad to be constructed and operated at Holloman AFB. He investigated simplified analysis techniques and alternate geometries for the prototype in an effort to reduce the cost and complexity of the proposed design. Final design is complete and construction is to begin in early FY 1981.

6. WIEDEMEIER, Dennis W., Lieutenant Colonel
BROWN, Gary E., Major
BOYCE, Steven C. Captain
BENSON, Joel D., Captain
UHLIK, Felix T., Captain
KEHLIAS, George A., Captain
WINTERS, Deacon L. Second Lieutenant

a. "Wing Energy Conversion Systems (WECS)." (Research)

This project is composed of two primary objectives: (1) Development and testing of a small vertical axis wind turbine (VAWT), and (2) Evaluation of wind data for potential wind turbine generator (WTG) siting. We have concentrated extensive efforts on refining the USAFA VAWT control system. This included designing, building, and installing a slotted disk with an optical pick-up to allow precise monitoring of the turbine rpm. (The earlier system relied on the alternator output and required at least 50 rpm for a readout while applying a load to the turbine.) This new system does not load the turbine and is accurate to zero rpm. We improved the control algorithm to enhance system stability. Other activities included designing, building, and calibrating a simple mechanical cable

tension meter to be used in monitoring the tension in the supporting cables. The evaluation of USAFA winds for future wind turbine generator siting has continued and we have now analyzed more than one year's data, compiled by Captain Boyce. The next step will include erection of a 30-meter tower for collection of data at two levels simultaneously from one location. This data will permit computation of an accurate power law distribution of wind speedup and enable determination of potential wind power at heights other than the present 10 meters. We have also begun investigation of institutional issues affecting WTG siting. Once a potential site is selected, based on wind data criteria, we can examine issues such as economic payback, electromagnetic interference, noise, FAA/airfield criteria, impact on flora and fauna, and existing networks. The USAFA Wind Site Survey Team visited Vandenberg AFB, 26-28 July 1980, for preliminary site analyses to determine wind energy potential. This was the first attempt at testing a methodology involving analyzing existing Environmental and Technical Applications Center (ETAC) data, preparing economic analyses, visiting potential sites, and suggesting further wind data sampling sites. Sponsored by the Air Force Engineering and Services Center, Tyndall AFB, FL.

b. "Wind Site Survey." (Presentation)

The Wind Site Survey Team briefed the USAFA Select Committee on total energy on 5 Sep 80. Lt Col Kullgren presented a summary of research conducted, Capt Kehias briefed on the computer methods used to analyze data, and 2Lt Winters presented both economic analyses of installing a WTG at USAFA and a proposal to install a 30-meter tower for further data gathering at USAFA.

CHAPTER G
Department of Economics, Geography, and Management

1. ANSELM, Michael S., Captain and Associate Professor

a. "Small Sample Properties of Alternative Estimates and the Power of Autocorrelation Tests in Models with Lagged Endogenous Variables When the Errors are AR(1) or MA(1)." *Review of Economics and Statistics*, submitted July 1980. [With J. M. Dowling] (Article)

For an econometric model that uses prior values of a variable (along with an independent variable) to predict future values of the variable, a regression technique developed by Zellner and Geisel is better than ordinary regression techniques (if the residual error values follow a first order moving average structure). If the residual values follow a first order autoregressive structure; a regression technique developed by Wallis should be used (if the autocorrelation of the residuals is relatively weak) or the regression technique developed by Cochrane and Orcutt (if the autocorrelation is relatively strong).

For the same econometric model, the authors found the Durbin-Watson d test for the presence of autocorrelation if the residuals can be used even though theoretically the test does not apply.

b. "Small Sample Properties of Several Alternative Estimators When the Errors are AR(1) or MA(1)." *Journal of the American Statistical Association*, submitted July 1980. [With J. M. Dowling] (Article)

This paper is similar to (a) above except that this study analyzed models with only exogeneous variables as regressors. The study in (a) above incorporated lagged endogenous variables as regressors.

2. BELAND, Robert D., Major and Associate Professor

a. "MX Environmental Impact Statement (EIS) Critique and Review." (Report)

See Lt Colonel William J. Weida

3. BURRELL, Stephen F., Lieutenant Colonel and Assistant Professor

a. "MX Environmental Impact Statement (EIS) Critique and Review." (Report)

See Lt Colonel William J. Weida

4. CANNY, Regis, Captain and Assistant Professor

a. "A Cost Analysis of the Proposed USAF Academy Visitor's Center." (Report)

See Lt Colonel William J. Weida

5. COLGROVE, Roger T., Major and Assistant Professor

- a. "MX Environmental Impact Statement (EIS) Critique and Review." (Report)

See Lt Colonel William J. Weida

6. GIBBS, Joe B., Jr., Captain (USA) and Assistant Professor

- a. "MX Environmental Impact Statement (EIS) Critique and Review." (Report)

See Lt Colonel William J. Weida

7. JOHNSON, Barry C., Captain and Instructor of Management

- a. "Management Information System for the Air Force Satellite Control Facility (AFSCF)." [With Captain Cathy W. Swan] (Research)

We are using a critical success factor technique to design and implement a Management Information System in the Satellite Control Facility. This is a tipdown approach incorporating their current and future information and decision configurations.

- b. "MX Environmental Impact Statement (EIS) Critique and Review." (Report)

See Lt Colonel William J. Weida

8. KOOL, Leslie H., Major and Assistant Professor Economics

- a. "The Czechoslovak Experiment in Political Economy: An Attempt to Place A Human Face on Socialism." USAF Academy Technical Note 80-1 (March 1980). (Note)

This technical note discusses the Czechoslovak attempt to discard the Leninist-Stalinist model of socialism. The paper sets the stage with a review of the historical precedents to the imposition of the Leninist-Stalinist model, the operation of the imposed model, and the conditions necessitating reform. I address the specific reforms mounted with the "Prague Spring" and the period just after the Warsaw Pact Invasion.

9. LANGLEY, Warren, Major and Associate Professor

- a. "MX Environmental Impact Statement (EIS) Critique and Review." (Report)

See Lt Colonel William J. Weida

10. MCLAIN, Dennis R., Major and Assistant Professor

- a. "MX Environmental Impact Statement (EIS) Critique and Review." (Report)

11. MITCHELL, William A., Major, Deputy for Research and Tenure Associate Professor

a. "Colorado Air National Guard Deploys to NATO's Southern Flank: A Case Study in Geographic Education." Washington, D.C.: Association of American Geographers, 1980. *Program Abstracts*, AAG, 76th Annual Meeting, Louisville, April 1980. Also presented at the Annual AAG Meeting and published by Maxwell AFB, AL: Air Command and Staff College, May 1980, Report 1660-80. (Case Study)

This study describes how the Colorado Air National Guard prepared for a deployment to Merzifon, Turkey, in support of NATO's Display Determination exercise. The USAF Academy's Middle East Study Group provided an indoctrination program stressing both Turkish language and basic knowledge about their host country. A chi-square test revealed a significant favorable change in attitudes after Guardspeople completed the program. The author deployed with the Guard and observed behavior in the field.

b. "Cross-cultural Communication and Cooperation." [With Lt Col Carl Reddel, Maj Doug Menarchik, and Maj Frank Kyriopoulos.] (Presentation)

A two-day presentation in August 1980, designed to actively develop and maintain positive interpersonal relations between members of the 116th Tactical Fighter Group, Georgia Air National Guard and their Turkish counterparts during the Guard's deployment to that country in September 1980, as part of NATO exercise Coronet Power. Presentations emphasized basic knowledge about the history, geography, culture, politics, and language of Turkey. Emphasis was on interpersonal actions, intercultural awareness, and sensitivities of Turkish people.

c. "A General Model for Forecasting Earthquake Reconstruction." (in progress) [with Lt Col William Weida and 2Lt David Larivee.]

See Lt Col William J. Weida.

d. "Intercultural Awareness for American Military Forces." (Presentation in progress)

I will present this paper in a special military geography session of the 77th Annual Meeting of the Association of American Geography, Los Angeles, California, in April 1981. The research attempts to reduce ethnocentrism and cultural arrogance by positive motivation with both knowledge and language training for overseas deployments by entire units or individuals.

e. "Intercultural Awareness for a NATO Deployment." (Presentation)

I presented an eight hour summary of cultural values and attitudes of Turkey to the 155th Tactical Reconnaissance Group, Nebraska Air National Guard, on 8-9 April 1980, in Lincoln, Nebraska. Emphasis was on the importance of cultural awareness and intercultural communication. This preparation was in support of a NATO deployment to Eskisehir, Turkey by the Nebraska ANG.

f. "Intercultural Education for the Mississippi Air National Guard—Coronet Gyro." [With Lt Col Carl Reddel, Maj Frank Kyriopoulos, Maj Taylor Barnes, and Capt George Haritos.] USAF Academy Technical Report, forthcoming. (Presentation)

A two day program in July and September 1980, designed to prepare the 186th Tactical Reconnaissance Group, Meridian, MS, for its deployment to Larissa, Greece. Presentations emphasized basic knowledge about the history, geography, culture, politics, and language of Greece. Emphasis was on developing a positive attitude about our NATO ally by providing accurate knowledge and sensitizing the Guardspeople about different culture values and attitudes.

g. "Intercultural Education for Overseas Deployments by Air Force Units." A two volume

USAF Academy Technical Report, forthcoming. [With Lt Col Carl Reddel, and Capt Bryant Shaw.] (Report)

This extensive report will serve as a guide for USAF and Air National Guard deployments to overseas environments. It draws from experiences with Colorado, Georgia, Mississippi, and Nebraska Air National Guard units. Basically, the report concentrates on a case study of the Colorado ANG deployments to Turkey, but also provides a critical assessment of USAF preparation for deployments. The report evaluates both successes and failures of past experiences.

h. "Natural Hazards Workshop." NSF, Institute of Behavioral Science, University of Colorado, July 19-22, 1980, Boulder, Colorado (Participant by invitation)

I participated as a consultant on reconstruction and resettlement problems associated with earthquake disasters in Turkey.

12. NORRIS, James M., Captain and Associate Professor

a. "MX Environmental Impact Statement (EIS) Critique and Review." (Report)

See Lt Colonel William J. Weida.

13. RESTON, Russell, T., Major and Assistant Professor of Economics

a. "Analyzing the Effectiveness of U.S. Arms Transfer Restraint—A Statistical Approach." USAF Academy Technical Report 80-15 (January 1980). (Report)

This paper demonstrates one way in which basic statistical techniques might be used to analyze the effectiveness of President Carter's policy of arms transfer restraint.

14. ROSEN, Harry W., Major and Assistant Professor

a. "MX Environmental Impact Statement (EIS) Critique and Review." (Report)

See Lt Colonel William J. Weida.

15. SAUNDERS, Earl F., Lieutenant Colonel and Assistant Professor

a. "MX Environmental Impact Statement (EIS) Critique and Review." (Report)

See Lt Colonel William J. Weida.

16. SCHWARZ, David E., Ph.D. and Visiting Associate Professor

a. "An Analytical Technique for Establishing Emergency Services Planning Policy: Effects of Building Characteristics on Forecasts of Seismically-Induced Route Blockages." (Final Report, National Science Foundation Grant No. PFR7823097, September 1980). (Article in progress)

I developed a technique to estimate the potential for earthquake-induced route blockage of streets in California cities and applied it to portions of San Francisco and Los Angeles. (This report is being edited and will be submitted for publication in a major professional journal.)

b. "Estimating the Potential for Seismically-Induced Rubble Blockage of Urban Streets in California." (Presentation)

I derived this presentation from a paper presented to the Annual Meeting of the Association of American Geographers in Louisville, KY, 16 April 1980, dealing with progress on NSF sponsored research developing techniques for estimating potential for rubble blockage of California streets.

c. "An Introduction to Remote Sensing Systems and Applications." (Tentative Title for Invited Chapter in Second Edition of: Holz, R., ed., *The Surveillant Science*. Boston: Houghton Mifflin [in preparation].) (Chapter in progress)

I am currently writing this introduction to remote sensing devices, the platforms on which they are mounted, and examples of their applications to earth resource inventions and mapping.

d. "Radar as a Remote Sensor." (Presentation)

I made this presentation to the Remote Sensing Workshop held 12 April 1980, in conjunction with the Annual Meeting of the Association of American Geographers in Louisville, KY. In it I outlined basic radar sensing techniques and their applicability to geoscience problems.

17. SWAN, Cathy W., Captain and Instructor of Management

a. "Management Information System for the Air Force Satellite Control Facility (AFSCF)." (Research)

See Captain Barry C. Johnson

b. "Readings in Federal Acquisition Management." (Editor)

I edited a book of articles to be used in the DFEGM course "System Acquisition and Management." (Mgt 485)

18. TAYLOR, Robert L., Lieutenant Colonel and Tenure Professor and Acting Head

a. "Air Force Professional Military Education and Executive Leadership and Management Development." USAF Academy Technical Report 80-1 (January 1980), 82 pp. [with Major Deonn M. Wall]. (Report)

We analyze Air Force Professional Military Education (PME) in terms of the industrial model of executive leadership and management development. We analyze also several PME programs of other services, within and outside the United States. We discuss relevant comparisons and contrasts with the conclusion that Air Force PME is more than executive development.

b. "Blue Tube—A Total Learning Environment." *Educational and Industrial Television*, 11 (December 1979), 35-39 [with Lt Col William J. Wallisch]. (Article)

This article discusses teaching through television—an innovative program designed to teach students the elements of communication by having them write, produce, edit, and direct an information program for their peers. Marketing students add to their experience by designing and producing commercials and by evaluating the impact of their productions by analyzing changes in awareness and responsiveness.

c. "Citizen Involvement in Setting Community Goals." USAF Academy Technical Report, forthcoming. (Report)

A statistical sampling of the citizens of Colorado Springs is used to identify attitudes and perceptions with regard to education, transportation, social services, design of the city, government, and the economy. Through a comprehensive questionnaire, citizen inputs will help to define the goals for the community of importance in the next decade. The results from this survey will be given to a group of community leaders who will then meet to articulate the goals so that government and business can unite around one objective in helping to achieve, over the next 10 years, those things of critical importance to the citizens of the community.

d. "Communication and Motivation: Your Two Most Important Management Tools." (Presentation)

In a workshop for the Medical Resource Management Symposium, I presented a half-day session on the tools and techniques of communication and motivation. Lectures, combined with film, cases and exercises management in today's dynamic environment. The workshop was held at Sheppard AFB, TX, on 8 May 1980.

e. "Management Curricula." (Presentation)

The National Defense University Management Symposium met at Ft. McNair on 29 October 1979. I participated in the precommissioning management education sessions, describing the USAFA curricula. In addition, representatives from the service academies developed normative models for consideration in future curriculum changes.

f. "The Open Air Market: A Plan for Downtown Revitalization." Intercollegiate Case Clearing House, (March 1980) and in French as "Le Marche: Un Projet Pour Renouveler Le Centra Ville" (With Kathleen M. Conley). (Case Study)

This case study focuses on the downtown area of a small city. City officials are evaluating ways to revitalize a deteriorating inner city. The French open-air market is suggested as a viable alternative. Cross-cultural differences in shopping habits and attitudes provide serious conflicting issues. We asked students to identify the strengths and shortcomings of the open-air market plan and provide a management recommendation to the city council.

g. "Performance Appraisal: A Review of the Literature." (Presentation)

As an adjunct member of the Air Force OER Working Group, I provide periodic updates on the current state of the relevant theory and research on performance to the permanent group (AFMPC/MPCZ) at Randolph AFB, TX. On 10 September 1979 and 9 October 1979, I participated in working group sessions on alternative approaches to the current OER in appraising officer performance and potential.

h. "Selecting a New Superintendent." (Case Study)

The scenario is set in a small school district where the superintendent of schools has just announced his resignation. The president of the school board is charged with designing a set of criteria for the new superintendent. A history of the district sets the stage for the student to define the attributes needed in evaluating the

credentials of prospective candidates.

i. "Time Management." (Presentation)

Planning, delegation, and useful tips for the effective management of time were the topics presented in a workshop to the 27th Annual Health Care Administration Symposium held at Sheppard AFB, TX, on 16 April 1980.

j. "Woodford Manufacturing Company." (Case Study)

I studied a small plumbing products firm. I first outlined financial planning, personnel plans, and strategic decision-making for the student to analyze the present situation and forecast future alternatives.

19. WALL, Deonn M., Major and Assistant Professor

a. "Air Force Professional Military Education and Executive Leadership and Management Development." (Report)

See Lt Colonel Robert L. Taylor.

20. WEIDA, William J., Lieutenant Colonel, Deputy of Economics and Tenure Associate Professor

a. Air Force Systems Command Cost Analysis Improvement Group. Throughout Fiscal Year 1980. (Consultant)

In this capacity I helped Headquarters Systems Command validate inflation index values and participated in the review and approval of numerous cost estimating techniques.

b. "The Church in the 1980's—An Economic Analysis." (Presentation)

This presentation covered the general state of the U.S. economy and how this would impact on church financial generations. I demonstrated forecasting methods which would allow a church to anticipate problem areas. I placed emphasis on the Church Business Administrator's role in implementing financial planning in the local church. Presented to the Convention of the National Association of Methodist Church Business Administrators. Indianapolis, Indiana, 22 July 1980.

c. "Church Funding and Operation in the Presence of High Inflation." (Presentation)

Topics covered were what national economic conditions are contributing to the current financing crisis in America's churches, how the church can deal with these conditions, and how the church can overcome resistance on the part of the congregation to corrective financial means. I made the presentation as a radio interview by the Iowa Public Radio Network on 25 August 1980.

d. "A Cost Analysis of the Proposed USAF Academy Visitors' Center." Done for the Air Force Academy Athletic Association, March 1980 [with Capt Regis Canny]. (Report)

This paper investigated possible financing and operating methods which could be employed for the New Visitors' Center. Based on a variety of projected tourism rates, we determined the optimal financing and food service policies.

e. "Econometric Modeling of Church Giving." (Presentation)

I demonstrated methods of forecasting church receipts based on past giving patterns and showed techniques which would allow the calculation at specific inflation indices for an individual church to aid in financial planning. Presented to the Administrative Board, First United Methodist Church, Colorado Springs, Colorado, 5 May 1980.

f. "Forecasting Military Weapon Expenditures From Sparse Data—The Implications of Risk Management." Submitted to the *Naval Research Logistics Quarterly*, April 1980. (Article)

This paper investigates possible methods of forecasting defense expenditures in the presence of sparse data. Major weapon purchase categories generated forecasts. I then compared risks to project failure and enemy surprise to production costs and development cycle time, and finally developed recommendations for least-risk actions.

g. "A General Model for Forecasting Earthquake Reconstruction" [with Maj William Mitchell and 1Lt David Larivee]. (Project in Progress)

A series of potentially damaging earthquakes at varying Richter magnitudes serve as the basis for several reconstruction scenarios. We will use a general reconstruction curve based on previous earthquakes to specify timing and magnitude for the economic assistance which will be required during recovery. This is in cooperation with the Mitigation Division of the Federal Energy Management Agency (FEMA).

h. "MX Environmental Impact Statement (EIS) Critique and Review." Done for the Honorable Antonia Handler Chayes, Under Secretary of the United States Air Force, 3 June 1980 [with Lt Col Stephen F. Burrell; Lt Col Earl F. Saunders; Maj Robert D. Beland; Maj Roger T. Colgrove; Maj James W. Downey; Maj Dennis R. McLain; Maj Harry W. Rosen; Capt Joe B. Gibbs, Jr.; Capt Barry C. Johnson; Capt James M. Norris; Capt Cathy W. Swan; Capt Michael S. Wenger; and Maj R. Warren Langley of FJSRL]. (Report)

This paper reviewed all of the Environmental Impact Work which HDR, Inc. had accomplished for the MX missile system. We conducted a critique of the deficiencies in this completed work in the areas of general approach, weather effects, community impact, regional industrial impact, general modeling, and econometric modeling. In all, we identified thirty-eight different problem areas and made recommendations to deal with those problems.

i. "Organizing the Church to Manage Inflation." (Presentation)

This presentation covered ways of organizing the governing bodies of the Catholic Parish to deal with rising costs and decreased giving. I paid particular attention to efficient use of existing facilities through better scheduling. Presented to the Parish Council, All Saints Catholic Church, Denver, Colorado, 7 November 1979.

21. WENGER, Michael S., Captain and Instructor

a. "MX Environmental Impact Statement (EIS) Critique and Review."

See Lt Colonel William J. Weida.

CHAPTER H

Department of Electrical Engineering

1. BURGE, Legand L., Jr., Captain and Instructor
Co-Author: YARLAGADDA, R. A.

- a. "An Efficient Coding of the Prediction Residual." *IEEE International Conference on Acoustic, Speech and Signal Processing 1979 Record*, Washington, D.C. (April 1979). (Article)

We present our designs for an efficient method of coding the prediction residual using the technique of sub-band coding at the bit rate of 9600 b/s. In the study, the premise is that the transitional information embedded in the phoneme connections of speech is most important. We used the energy in the prediction residual to distribute the bit allocation. We then discussed the relation between the transform coding and the sub-band coding along with a brief explanation of the Articulation Index and its use in the selection of sub-bands.

2. CARROLL, David R., Colonel and Tenure Professor
Co-authors: Neil Catone, Michael Stefaniak, Albert J. Rosa

- a. "A Minicomputer-controlled, 60-foot Parabolic Antenna" (to be published, Fall 80). (Report)

As we continue the consulting project for the USAF Satellite Control Facility, Sunnyvale, CA, our current task requires converting the present mechanical analog computer to a minicomputer for pointing a 60-foot antenna at Camp Parks, CA. The task has included recommending a suitable minicomputer and developing the necessary software.

3. JOHNSON, Robert W., Major and Assistant Professor

- a. "Computer Technology Forecast and Weapon Systems Impact Study (COMTEC-2000); "AIAA International Meeting and Technical Display, "Global Technology 2000." (Article)

This paper summarizes the results of a two-year study forecasting the expected growth in computer technology and the impact this growth could have on Air Force weapon systems through the year 2000. More details are published in a three-volume report available through DDC (DDC control numbers BO34954, BO34955, and BO41871).

4. POLLARD, Joseph J., Captain and Associate Professor

- a. *El Eng 464A Microprocessor System Development*, USAFA, June 1980. (Final Technical Report)

This report details the development and implementation of an 8086-based microprocessor system by fourteen cadets at the United States Air Force Academy during the spring semester 1980 as part of El Engr 464. The computer consists of CPU, Interrupt Control, RAM, ROM, Input, Output, Discrete Input, Serial I/O boards, and the mother-board. The computer was designed for use at the United States Air Force Test Pilot School at Edwards AFB, California as part of an aircraft instrumentation system. We provide information concerning the software used in the system is also given and is an outgrowth of other research activities described below.

- b. *The USAFA/8086 a State of the Art Microprocessors System, Vol I, System Hardware*, USAFA

Technical Report, June 1980. (Technical Report)

This final technical engineering report details the research and development of a modern sixteen bit microprocessor-based computer system. The system uses state-of-the-art devices for many functions often found only in minicomputers and other larger systems. The research was performed under the joint sponsorship of the Air Force Flight Dynamics Laboratory (WPAFB, OH) and the Frank J. Seiler Research Laboratory (USAFA, CO) from August 1978 to March 1980.

c. *The USAFA/8086 A State of the Art Microprocessor System, Vol II Software Documentation*, June 1980. (Technical Report)

This report details the software developed at the US Air Force Academy to support development of the USAFA/8086 microprocessor system. There are three primary modules consisting of the non-disk operating system (USAF86), the disk operating system (DOS86), and the disk interface software (DISK86). The first two modules are written in PLM86 while DISK86 is written in ASM86. We have included an operator's manual as an appendix.

5. ROSA, Albert J., Lieutenant Colonel and Tenure Associate Professor

- a. "Circuits and Signals" 3rd Edition January 1980
4th Edition June 1980. (Book)

Co-author: Roland E. Thomas

We use this introductory text on circuits and signals in El Engr 340, the first course for El Engr majors. The text uses a behaviorally motivated objective approach to learning. It emphasizes concept integration through analysis, synthesis, and evaluation. The text departs from classical approaches to circuits by including operational amplifiers as a linear element and by teaching AC circuits using Laplace techniques.

- b. "A Minicomputer Controlled 60-foot Parabolic Antenna" (to be published, Fall 80) (Report)

Co-authors: Neil Catone, Michael Stefaniak, David R. Carroll

As we continue the consulting project for the USAF Satellite Control Facility, Sunnyvale, CA, our current task requires converting the present mechanical analog computer to a minicomputer for pointing a 60-foot antenna at Camp Parks, CA. The task has included recommending a suitable minicomputer and developing the necessary software.

6. STEWART, Clayton V., Lieutenant Colonel and Assistant Professor

- a. "An X-Band Collision Avoidance Radar for Emergency Vehicles." *IEEE Region V Digest*, San Antonio, TX (April 1980). (Article)

Co-author: James R. Skotnicki

We presented the design of an X-band, automotive collision-avoidance radar which could be used on police, fire, and emergency medical vehicles.

- b. "Application of Infrared Thermography in the Analysis of Induced Surface Currents Due to Incident Electromagnetic Radiation on Complex Shapes." *Proceedings of the SPIE Electro-Optical*

Technical Symposium, Huntsville, AL (September 1980). (Presentation)

Co-authors: V. M. Martin, R. M. Sega, and R. W. Burton

We described a method of removing the shape-dependence from thermographic determination of surface currents induced by electromagnetic radiation.

c. "Application of the Infrared Detection of Surface Currents." *Proceedings of the National Radio Science Meeting*, University of Washington, Seattle (June 1979). (Presentation)

Co-author: Robert W. Burton

We presented a method that is useful for rapidly measuring the magnitudes of charge and surface current distributions using an infrared scanner.

d. "Electronic Warfare and Radar Target Recognition." *SECRET Proceedings of the Twenty-Fifth annual Joint Electronic Warfare Conference*, Naval Postgraduate School, Monterey, CA (May 1980). (Presentation)

I explain some of the possible approaches to radar target recognition and investigated their susceptibilities to electronic countermeasures.

e. "Some Computational Aspects of Bayesian Decision Theory Applied to Multisensor Correlation." *Proceedings of the DoD Non-Cooperative Target Recognition Conference*, Naval Ocean Systems Center, San Diego, CA (September 1979). (Presentation)

I address two specific computational aspects of Bayesian decision theory applied to multisensor correlation (MSC) for target identification. I demonstrate that a typical 8-bit microprocessor could perform the necessary calculations in real time for a reasonably sized problem. The paper also dealt with the degradation in performance of a Bayesian MSC system under assumptions of various types of statistical errors that are likely to occur.

7. WARMUTH, Donald B., Major and Assistant Professor

a. *Data Communication Short Course Spring 1980*, USAF Academy (April 1980). (Book)

Co-author: Barry L. Mitchell

Locally published book in support of a short course taught by the authors at Griffiss AFB, NY in May 1980.

CHAPTER I
Department of Engineering Mechanics

1. BAGLEY, Ronald L., Captain, Assistant Professor

a. "Constitutive Modeling of Dissipative Materials." (Research)

Sponsored by Air Force Wright Aeronautical Laboratories, Wright-Patterson AFB, Ohio

This research is in support of the F-100 engine project. The research focuses on describing the relationships between time dependent stress and time dependent strain in enamels and polymers. The goal is to determine the feasibility of reducing vibration damage in engine components using polymer or enamel coatings that absorb vibrations.

2. CARTER, Dale K., Captain, Assistant Professor

a. "Fatigue Crack Growth in Engine Materials." (Research)

Sponsored by AFWAL/ML

Associate Investigators: Captains David J. Morrison (DFEM), John B. Sullivan (DFEM), Michael C. Mushala (DFEM), Patrick K. Talty (DFEM), George K. Haritos (DFEM), Paul D. Copp (DFEM), Perry Reimers (DFF), Major George W. Watt (DFEM), and Lt Colonel Thoms E. Kullgren (DFEM).

The objective of this project is to investigate fatigue crack growth under high temperature, low cycle fatigue conditions in support of the AFWAL/ML program on life prediction in turbine engine materials. Increased performance requirements for USAF gas turbine engines result in the engine components being subjected to high operating stresses in severe high temperature environments. Very conservative design has resulted in the displacement of turbine disks at specified intervals though the disks may not have critically-sized flaws. This procedure is very costly and new design concepts such as Retirement-For-Cause are being studied to reduce the incidence of premature retirement. We've aimed this project at developing theoretical and experimental tools required to implement this new concept. Specifically, the project is characterizing and modeling surface flaw propagation in a titanium alloy under engine conditions.

3. COPP, Paul D., Captain

a. "Damage by Foreign Objects to J79 Boron/Aluminum Blades" final report, Air Force Propulsion Laboratory. (Article in progress)

The results for blade displacements compare reasonably well with actual bird ingestion data and finite element analyses conducted by the General Electric Corporation of Evendale, Ohio. Also, the results identify areas of the analysis that must be improved to proceed with development of improved foreign object damage analysis.

4. GAJEWSKI, Ralph R., Captain, Associate Professor

a. "Modal Analysis for Aircraft Response to Runway Surface Roughness." (Report)

I prepared this report for HQ AFESC/RDRC at Tyndall AFB, Florida. The final report develops one and three

degrees of freedom linear vibrations models for the prediction of aircraft response to runway surface roughness. I have integrated the equations of motion in principal coordinates using model analysis. The model parameters required are natural frequency damping ratio, and mode shape for each degree of freedom. I've made a comparison of results with the TAXI code that has a nonlinear strut model and finally, I present the results for asymmetric motion due to spall profiles in the runway.

5. HARITOS, George K., Captain, Assistant Professor

a. "Stress Analysis for an Elastic Half Space Containing an Embedded Rigid Block." (Article) *International Journal of Solids and Structures*, 16, 19-40, (1980).

Co-Author: L. M. Keer, Northwestern University, Department of Civil Engineering, Evanston, Illinois

This paper investigates the plane elasticity problem of a rigid rectangular block partially embedded in, and perfectly bonded to, an elastic half space. We've formulated the problem as a mixed boundary value problem, and this leads to a system of coupled singular integral equations whose unknowns are the normal and shear stress discontinuities between the bonded surfaces. Numerical solution of these equations leads to the calculation of several physical quantities, such as the diffusion of the load from the block into the elastic half space and the rotational stiffness.

b. "Subsurface Cracking and Delamination." *American Society of Mechanical Engineers Journal of Lubrication Technology*, submitted. (Article)

Co-authors: L. M. Keer and M. D. Bryant, Northwestern University, Department of Civil Engineering, Evanston, Illinois

This paper considers the problem of a cracked elastic half space whose surface is loaded by Hertzian contact stresses. The elastic half space contains a horizontal subsurface crack and surface breaking vertical crack. We've used numerical results to correlate crack geometry to fracture and introduce possible crack-propagation mechanisms.

c. "Two- and Three-Dimensional Stress Analysis of an Elastic Half Space Containing a Partially Embedded Finite Rod." (Presentation)
Presented at the XVth International Congress of Theoretical and Applied Mechanics, Toronto, Canada, 18-22 August 1980.

Co-authors: L. M. Keer, Northwestern University, Evanston, Illinois; V. K. Luk, Joseph Oat Corporation, Camden, New Jersey.

We presented the results obtained from plane and three-dimensional elasticity analyses of a finite block (rod) embedded in an elastic medium.

6. HEMING, Francis S., Jr., Captain, Associate Professor

a. "An Investigation of the Dynamic Response of a Seismically Stable Platform (Platform Dynamic Response)." (Research)

Sponsored jointly by Frank J. Seiler Research Laboratory, USAFA, and Central Inertial Guidance Test Facility, Holloman AFB, New Mexico.

Association Investigators: Major Richard M. Hanes (DFCE), Major H. D. Bartel (DFCE), and Mr. Bill J. Simmons (FJSRL).

There is presently a requirement for a more stable test platform for advanced guidance systems. In support of the overall effort underway, this project addresses three specific areas: experimental dynamic testing, theoretical analysis and verification, and design guidance and consultation. The objective of the experimental testing is to determine the natural frequencies and mode shapes of the isolation test pad (Iso-pad) located in the USAFA Guidance and Control Laboratory. A state-of-the-art modal extraction software package called MODAL-PLUS provides this capability. We will verify a theoretical model of the Iso-pad via a NASTRAN finite element analysis using the experimental results. We can then use the NASTRAN model to determine the effects of design changes. The information and experience gained through this procedure can be used to provide design guidance and consultation on the next generation of the test pad. Consultation has been provided on a prototype design submitted to Holloman by the prime contractor. Construction of the prototype is scheduled for early FY 81.

7. KULLGREN, Thomas E., Lieutenant Colonel, Tenure Associate Professor

a. "Static Fracture Testing of PMMA Plates Having Flawed Fastener Holes." *Experimental Mechanics*, March 1980. (Article)

Co-author: F. W. Smith, Colorado State University

We've described a series of static fracture experiments on PMMA (Plexiglas) plates containing surface cracks near holes and compared results to theoretical computer predictions.

b. "Stress Intensity Factors for Corner Cracked Holes Under General Loading Conditions." *Emerging Technologies in Aerospace Structures, Design, Structural Dynamics and Materials*, Proceedings of the ASME Aerospace Conference, 10-21 August 1980, San Francisco. (Presentation)

Co-author: A. F. Grandt, Jr., Purdue University

We've used the finite element-alternating method to find mode-one stress intensity factors and crack opening displacements for constant through third-order crack face pressures. Superposition of results from the four pressures cases permits consideration of cracks adjacent to fastener holes in plates under many differing loading conditions.

c. "USAF Academy Wind Energy Conversion System Project—Vertical Axis Wind Turbine Task." AF ENGR and Services Center. (Research)

Associate Investigators: Lt Colonel Dennis Wiedemeier, Major Gary Brown, and Captain Joel Benson, DFCE.

The USAFA Vertical Axis Wind Turbine Test Program continues. We've tested this small wind machine, controlled by a minicomputer several times. We've updated the software in search of an optimum control scheme for this type of wind machine. But low test site wind speeds and computer hardware problems have slowed the test program. We present interim results in a technical report currently under review and scheduled for release in early FY 81.

d. "USAF Academy Wind Energy Conversion System Project—Wind Site Survey Task." Air Force Engineering Service Center. (Presentation)

Associate Investigators: Captains Steven Boyce, George Kehias and Felix Uhlik, DFCE.

We've completed a wind site survey of the USAFA installation. We are now reducing data and will publish results in FY 81. We'll also present methodologies for surveying other Air Force bases.

e. "Wind Site Survey of Vandenberg AFB." Presented at Vandenberg AFB, 29 July 1980. (Presentation)

Co-presented with Captains George Kehias and Felix Uhlik, DFCE, USAFA. .

We presented results of a physical wind site survey of Vandenberg AFB to base personnel. Included was an economics study dealing with the possible installation of large wind machines at that base.

f. "Wind Site Survey of the USAF Academy." Presented at USAFA, 5 September 1980. (Presentation)

Co-presented with Captain George Kehias and 2Lt Deacon Winters.

We presented an overview of the USAF Academy Wind Energy Conversion System Project to the USAFA Select Committee on Energy. Our emphasis was with wind site survey results including economic studies of certain wind machines in the USAFA environment.

8. TALTY, Patrick K., Captain, Assistant Professor

a. "New Metal Joining Techniques." Sponsored by the Department of Energy on a consulting contract for the Lawrence Livermore Laboratory, CA. (Research)

I've directed a project to improve low temperature brazing techniques used to join dissimilar metals that are not metallurgically compatible. Conventional brazing accomplished at high temperatures often causes undesirable reactions in the dissimilar base metals. To alleviate this problem, I've developed a low temperature quick touch braze. The touch braze utilizes intermediate coatings of aluminum and silver and is applicable to a wide range of base metals.

CHAPTER J

Department of English

1. AHERN, Donald E., Major and Associate Professor

- a. "'But a Lewd Compiler'—Chaucer's *A Treatise on the Astrolabe as Technical Writing*." MLA Conference, San Francisco December 1979. (Presentation)

I looked at Chaucer in terms of technical writing.

- b. "*Literature in the Education of the Military Professional*." USAFA, CO: DFENG, 1981. (Research in progress)

This research report consists of articles by department members dealing with the question of why a military professional needs to have a good background in literature.

- c. "'The Old English 'AE' Sound From Indo-European Long 'E'." MLA (forthcoming October 1980). (Presentation)

I present a new theory of sound changes in language.

- d. "*The Old English Life of St Giles and Life of St. Nicholas*." Toronto: University of Toronto Press, (forthcoming) 1981. (Manuscript)

This is an edition of a previously unpublished manuscript of Old English Saints' Lives in Corpus Christi College, Cambridge.

2. AUBREY, James R., Major and Associate Professor

- "Alexander Pope and 'Picturesque' Landscape." Literary Illustration, South Central Society for Eighteenth Century Studies. Austin, (forthcoming) March 1981. (Presentation)

- b. "Alexander Pope and 'Picturesque' Landscape." Sister Arts, RMMLA Convention Denver (forthcoming) 18 October 1980. (Presentation)

Although Pope influenced the eighteenth century landscape gardening movement, he used the word *picturesque* in the older sense of "graphically vivid" as well as in the more fashionable sense applied to landscapes that please the eye.

- c. "*The Gimbel Library: A Checklist of Holdings, 1660-1800*." USAF Academy, CO: USAFA, March 1980. (Bibliography)

This is an annotated bibliography of the bound material in the Gimbel Library of possible interest to students of literature.

- d. "Samuel Johnson and Pope's *Epistle to Burlington*." Rocky Mountain Johnson-Boswell Society, Boulder, CO: (forthcoming) April 1981. (Slide Presentation)

Using slides of buildings and landscapes, I'll trace the history of interpretation of Pope's *Epistle IV: To Burlington*

and offer some thoughts about why Samuel Johnson in particular seems to have mis-read Pope.

- e. "Taming Beowulf's Monsters." *Old English Newsletter*, Spring 1980. (Article)

This article deals with the Anglo-Saxon values-in-reverse, as represented by the monsters in *Beowulf*.

- f. "Timon's Villa: A Composite Picture" 1981. (Research in Progress)

I argue that Pope used details from various English estates to create his satirical sketch in *Epistle IV: To Burlington*, aimed at bad taste in general rather than at some one "enemy" in particular.

3. BURNS, Hugh L., Captain and Associate Professor

- a. "Education's New Management: The Personal Computing Underground." *Pipeline*, (forthcoming) Fall 1980. (Article)

I argue that undergraduate students have been using microcomputers more than their respective faculties for studying, reviewing, and writing.

- b. "Rhetorical Invention and the Computer." A University of Wisconsin Workshop 15 November 1979. (Presentation)

I prescribe use of computers for undergraduate instruction in the humanities.

- c. "Stimulating Invention in English Composition Through Computer-Assisted Instruction." *Educational Technology*, August 1980, pp. 5-10. (Article)

This article describes how prewriting can be stimulated by using Aristotle's topics, Burke's pentad, and the tagmemic matrix—all nice computer-assisted instruction.

- d. "The Writer's Tool: Computing as a Mode of Inventing." New York College English Association Conference, Saratoga Springs, NY, 4 October 1980. (Presentation)

I explore how open-ended computer programs can stimulate thinking and discuss the qualitative and quantitative differences which occur when students use three different heuristic procedures.

4. CLERC, Charles, Distinguished Visiting Professor

- a. *Approaches to "Gravity's Rainbow."* Under review by Ohio State University Press. (Forthcoming critical book)

Introduction and eight critical essays. I edited the book, wrote the introduction and an essay.

- b. "In the Room the Women Come and Go, Talking of Judy Chicago." Under review by *Houston City Magazine*. (Forthcoming critical analysis)

This is a critical analysis of the exhibit *The Dinner Party*.

- c. *Tiger Lily*. Under review by *Tower Publications*. (Forthcoming novel)

d. *Tiger Wings*. (Research in Progress.)

A novel planned for 1981.

5. CUMMINGS, Edwin F., Jr., Captain and Assistant Professor

a. Rev. of *The Cruellest Night*, by Christopher Dobson, et. al. *Naval War College Review*, 32, No. 3, May-June, 1980, 113-4. (Review)

6. DEGI, Bruce J., Captain and Assistant Professor

a. "Basketball Brown: the Use of the Basketball Metaphor in *Going After Cacciato*" 1981. (Research in Progress)

I apply the "fundamental myth" idea proposed by Murray Ross in "Football Red and Baseball Green" to basketball, specifically as it's used in *Cacciato*.

b. "Myth, Magic, and Metaphor: Sports in American Fiction." Using Literature, Conference on Freshman and Sophomore English, University of Wyoming, July 1980. (Presentation)

This is a brief discussion of the rationale behind teaching sports literature and one way to set up a college-level course.

7. FINKELSTEIN, Leo, Jr., Major and Associate Professor

a. "The Calendrical Rite of the Ascension to Power." *Western Journal of Speech Communication*, (forthcoming) January 1981. (Article)

The article relates changes in presidential inaugural linguistic behavior and thematic substance to social change beginning with the great depression. It looks at audience pluralization and electronic media and relates these to anthropological concepts of stress and ritual.

b. "Eng 330" Technical Writing, Colorado Language Arts Society. Colorado Springs, Broadmoor, Spring 1980. (Presentation)

c. "Eng 330," Technical Writing, Seminar for Teaching Technical Writing. USAF Academy, (forthcoming) October 1980. (Presentation)

In both of these talks I described the Academy's unique technical writing program, including its team teaching, its flexible scheduling, and rewrites. I also presented empirical research in support.

d. "Student's Concept of Self as a Factor in Classroom Interaction" 1981. (Research in Progress)

I am performing empirical research using University of Colorado students at Cragmoor.

8. GASPAR, Charles J., Captain and Assistant Professor

a. "Teaching English Fundamentals at the Air Force Academy." Freshman English, Colorado Language Arts Society, Colorado Springs 13-16 March 1980. (Presentation)

b. "Teaching English Fundamentals at the Air Force Academy." Freshman English, Consortium for English, Gunnison, CO, April 1980. (Presentation)

Major Bud Kelley, Captain Ed Tompkins, and I shared our experiences, discoveries, and insights concerning the English 110 program. We concentrated on what kind of assignments to make, what factors to emphasize in grading, and what part reading plays in teaching writing.

9. GASTON, James C., Lieutenant Colonel and Tenure Associate Professor and Deputy Head

a. "PILGRIMAGE" USAFA, 1980. (Multi-media Presentation)

This multi-media and videotape program features James Dickey responding to AF experiences from WWII.

b. "Samuel Curwen" Greenwood Press, (forthcoming) 1980. (Article)

A section of *American Writers Before 1800*. My section includes a biography, a critical analysis of Curwen's writings, and a bibliography of writings about Curwen.

10. GRIMSHAW, James A., Jr., Lieutenant Colonel and Tenure Professor

a. "*Cleanth Brooks at the United States Air Force Academy*." USAFA, CO: Department of English, 1980. (Monograph)

This monograph is an edited version of Cleanth Brooks' lectures to two English classes (111H and 406), his faculty seminar with members of DFENG, and his lecture under the auspices of the Distinguished Speakers Program. "The Purpose and Use of the Humanities," 11-12 April 1978.

b. "Elk-Spotting in Church Park: An Eschatology" *Southern Review*, 16 (forthcoming) Fall 1980. (Poem)

Through eschatological references and images, my poem deals with the subject of Divine and parental love.

c. "*The First Twenty-Five Years*" USAFA, CO: DF, 1979. (Essays)

I was a member of the 25th AERC and served as managing editor of this collection of essays which represents some perceptions of the USAF Academy's first quarter century.

d. "*The Flannery O'Connor Companion*." Westport, CT: Greenwood Press, (forthcoming) Winter 1981-1982. (Reference Book)

A basic reference book aimed at high school and lower-level college courses, *FOC* includes discussions of this Southern writer's short fiction, two novels, essays, and letters and of her particularly Catholic point of view in revealing her theme.

e. "*Persuasive Technical Writing*." New York: John Wiley & Sons Publishers, Inc., (forthcoming) 15 September 1981. (Textbook)

This textbook on technical writing takes a forward look at the state of the art in tech writing and emphasizes the persuasive nature of the field. I designed the chapters for adaptability in college courses as well as in training-in-industry programs.

f. "*Robert Penn Warren: A Descriptive Bibliography, 1917-1979*." Charlottesville: University Press of Virginia, (forthcoming) Fall 1981. (Bibliography)

In the larger sense of the word *bibliography*, this work includes the description and identification of Warren's editions, their dates of issue, and typographical features; checklists of his other publications and manuscripts; and checklists of critical articles about his writing.

g. "Robert Penn Warren's *Brother to Dragons*: A Discussion and a Tribute on the Occasion of His 75th Birthday," Modern Language Association Convention, San Francisco, 29 Dec 1979. (Presentation)

I served as moderator for a panel of distinguished scholars: C. Hugh Holman, University of North Carolina at Chapel Hill; Lewis P. Simpson, Louisiana State University; Richard G. Law, Washington State University; and Victor Strandberg, Duke University. (The LSU Press is considering publishing the papers from this session in a collection of essays on *BD*, which I am editing.)

h. "Shakespeare's *Henriad* and Warren's *All the King's Men*." *Southern Review*, 17 (forthcoming) Winter 1981. (Article)

Here is an examination of Shakespeare's tetralogy—*Richard II*, *Henry IV*, (Parts I and II), and *Henry V*—and Warren's Pulitzer-Prize winning novel about a Southern demagogue in terms of the corrupting influence of absolute power.

11. HARLAN, Raymond C., Major and Assistant Professor

a. Ed. *Development of the GAU-8 30mm Aircraft Cannon*. Washington, D.C.: Air Force Systems Command Historian's Office, September 1980. (History)

I edited this classified document for the Air Force Systems Command.

b. "*Hal: An Adaptation from Shakespeare*." (forthcoming) 1981. (Play)

A original play adapted from *Henry IV*, parts I and II.

c. "The Need to Study War." *Newsweek*, 1 September 1980, p. 14. (Editorial)

Civilian colleges should prepare their students to be responsible citizens by requiring them to study military history and tactics. Studying past battles will better equip students to analyze the military-political problems of our day.

d. "Simplifying Electrical Prop Design," *Theatre Crafts*, October 1980. (Article)

Unskilled laborers can produce sophisticated and artistic props if the designer keeps laborers' limitations in mind and uses circuits from existing mechanisms.

- e. "Vicky: Review of the Star Bar Player's Production," *Theatre Journal*, October 1980. (Article)

Difficulties with the transition from TV to live theatre made the script an unwieldy vehicle and prevented the company from presenting a polished production.

12. HOGGE, Robert M., Captain and Instructor

- a. "Hemingway's Twentieth-Century Medievalism." Tucson, AZ: University of Arizona, March 1980. (Dissertation)

Although Hemingway is usually described as an author who writes about the fragmentation of value systems in the twentieth century, this study shows how Hemingway constantly returns to medieval themes and motifs in order to suggest that ideas of unity and meaning do exist in the modern world.

- b. "Hemingway's Twentieth-Century Medievalism" and "Modal Artistry in Hemingway's *The Old Man and the Sea*" 1981. (Research in Progress)

13. KELLEY, Wayne, Major and Instructor

- a. "New Approaches to Writing Workshops." Western State (CO) Conference on Composition, April 1980. (Presentation)

I discussed the English 110 program.

- b. "Teaching English Fundamentals at the Air Force Academy." Freshman English, Colorado Language Arts Society, Colorado Springs. 13-16 March 1980. (Presentation)

Captain Jay Gaspar, Captain Ed Tompkins, and I shared our experiences, discoveries, and insights concerning the English 110 program. We concentrated on what kind of assignments to make what factors to emphasize in grading, and what part reading plays in teaching writing.

14. KEMPF, James M., Captain and Instructor

- a. "English in a Technological Economy: Personal Reflections." Address to the General Convention, Southwest Region of the National Council of Teachers of English, Las Vegas, Nevada. 18 October 1980. (Presentation)

This paper describes personal experiences as an editor in the electronics industry and the skills required of English majors to function in a modern technological society.

- b. "Exiles and Establishmentarians: A Biographical Study of Malcolm Cowley" (forthcoming dissertation for Northwestern University) 1980. (Research in Progress)

I present a biographical study of the development of Cowley's thought in relation to twentieth century literature and intellectual history.

c. Rev. of *The Dream of the Golden Mountains: Remembering the 1930's*, by Malcolm Cowley. *Rocky Mountain Review*, Vol 34, No. 4, (forthcoming) Fall 1980. (Review)

d. Rev. of *The Seventh Enemy: The Human Factor in the Global Crisis*. *Air University Review*, (forthcoming) 1980. (Review)

15. LUCKETT, Perry D., Captain and Associate Professor

a. "Early Powered Flight and Popular Literature." Powered Flight: Wright to Lindbergh, Air Flight and Travel Conference of the American Popular Culture and American Studies Associations, Wichita State University, 5-7 November 1980. (Presentation)

This multi-media presentation based on holdings in the Gimbel Aeronautical Library shows the explosion of popular newspaper and magazine accounts of test flights, special medallions, pulp novels, "how-to" manuals, and histories dealing with powered flight. It also demonstrates the impact of flight on popular culture in America.

b. "An Explication of Emily Dickinson's 'My Life Closed Twice.'" *The Explicator*, (forthcoming) 1980. (Note)

This note demonstrates Dickinson's craftsmanship by relating rhetorical structuring, word choice, punctuation, and stanzaic form to the theme of parting as a reflection of separation from Godhead.

c. *The Gimbel Library: A Checklist of Holdings, 1660-1800*. USAF Academy CO, March 1980. (Bibliography)

This is an annotated bibliography of the bound material in the Gimbel Library of possible interest to students of literature.

d. "James Fenimore Cooper's *The Pioneers* and Maxwell Anderson's *High Tor*" 1980. (Research in Progress)

I argue for Cooper's *The Pioneers* as a source for Anderson's *High Tor*.

e. "Maxwell Anderson's Skepticism in His Political Plays" 1980 (Research in Progress)

I relate skeptical thought in Anderson's early poetry and essays to his political views in the 1920's versus those in the 1950's.

f. "Powered Flight, 1903-27: A Bibliographical Summary." *Journal of American Culture*, Fall/Winter 1980. (Article)

The article summarizes the Gimbel Library holdings on powered flight from the Wright Brothers to just before Lindbergh's transatlantic "victory." It's divided into two parts: (1) non-book and manuscript materials and (2) printed books. The wealth contained in the collection comes alive through selective description of hundreds of medallions, letters, newspapers, textbooks, memoirs, and dime novels dealing with flight.

g. "Technical Writing." An Appendix to AFP 13-2. Washington, D.C.: Department of the Air Force, (forthcoming) 1981. (Appendix)

The appendix defines technical writing; describes its audience levels and range of style; and gives "how-to" advice

on formats, conventions, and writing instructions.

16. MACE, Jennings R., Major and Associate Professor

- a. "American Reaction to Early Powered Flight." 1981. (Research in Progress)
- b. *The Gimble Library: A Checklist of Holdings, 1660-1800*. USAF Academy, CO, March 1980. (Bibliography)

This is an annotated bibliography of the bound material in the Gimbel Library of possible interest to students of literature.

- c. *Jesse James*. Westport, CT: Greenwood, (forthcoming) 1 September 1982. (Bibliography)

One of a series of bio-bibliographies projected by Greenwood Press, the text I am working on will focus upon James's influence on popular culture, and one chapter will be devoted to James's life.

- d. "Jesse Stuart and the Southwest Humorists." Criticism, Jesse Stuart Greenbo Sessions, Greenbo Lodge, KY., 25 May 1980. (Presentation)

My purpose was to show the clear link between Jesse Stuart and his 19th century forerunners. Jesse Stuart has the same earthy concern for life and death, violence, sex, and humor illustrated by the Southwestern humorists, but he does not show their distance or aloofness from the characters discussed.

- e. *Jesse Stuart: The Egyptian Journal*, 1981. (Research in Progress)

I am editing this 1500-page unpublished manuscript.

- f. "Powered Flight, 1903-27: A Bibliographical Summary." *Journal of American Culture*, Fall/Winter 1980. (Article)

17. MARTIN, Gina, Captain and Instructor

- a. "The First Four Years at USAFA: A Survey Concerning Attitudes and Experiences," 1980. (Research)

I am surveying 200 cadets and 100 parents to determine attitudes and how we can reduce attrition.

18. McCARRON, William E., Major and Associate Professor

- a. "But A Lewd Compiler—Chaucer's *A Treatise on the Astrolabe* as Technical Writing." MLA, San Francisco, December 1979. (Presentation)

I looked at Chaucer in terms of technical writing.

- b. "Hidden Persuasion in Technical Writing." Technical Writing, Southern Nevada Teachers of English, Las Vegas, NV, 16 October 1980. (Presentation)

Technical writing is straightforward, objective writing, but it also has a persuasive edge since most companies are selling *their* product, not just a product.

c. "In the Business World and in Academe: The English Teacher in the 1980s." *College English*, 41, No. 7 (Mar 1980), 812-21. (Article)

English teachers must be prepared to teach composition and technical writing in the 1980s.

d. *Later Metaphysical Poets: A Bibliography of Studies, 1961-1979*. (for Trinity University Press' Checklist in the Humanities Series), June 1981. (Research in Progress)

e. "A Newly Recovered Donne First Edition." *Seventeenth Century News*, 37, #3 & 4 (Fall, Winter 1979), 72. (Article)

The Gimbel collection has a mint-condition first edition of Donne's *Poems* (1633). This particular copy originally belongs to two of the most renowned nineteenth century scholars, Augustus Jesopp and Sir Edmund Gosse.

f. *Persuasive Technical Writing*. New York: John Wiley & Sons, 15 Sep 1981. (Textbook)

This 400-page textbook includes chapters on memo writing, resumes, business letters, and technical reports. The underlying assumption of the book is that technical writing is meant for a broadly educated, but not necessarily scientific, audience. Also, tech writing is the reporting of technical information in an objective, persuasive way.

19. MILLER, Doris, Captain and Instructor

a. Rev. of *Leionnaire: My Five Years in the French Foreign Legion*, by Simon Murray. *Air University Review*, (forthcoming) 1981. (Review)

20. O'ROURKE, James S., Captain and Assistant Professor

a. College Newsletters." Colorado Public Relations in Higher Education Meeting, USAF Academy, 14-15 August 1980. (Presentation)

I was a participant in a symposium exploring the role of college newsletters, barriers to success, and editorial methodology.

b. "The Development of Color Television: A Study in the Freemarket Process." Under review by *Culture and Technology*. (Research in Progress)

I examine the freemarket process and the genius of David Sarnoff's research team at RCA which made color TV possible.

c. "The Introduction of Videotaped Instructional Material into the Curriculum of the USAF Air Command and Staff College Associate Seminar Program: A Comparison of Educational Strategies." Syracuse University, March 1980. (Dissertation)

I discuss the role of television at ACSC.

d. "The Irrational Astronomers." *Air University Review*, (forthcoming). (Article)

I examine the philosophical bridge between astrophysics and metaphysics: the implications of our expanding cosmos and why certain scientists continue to ignore their own evidence.

e. "Is Television Color Educationally Justifiable? A Review of the Research." Under review by *Audiovisual Instruction*. (Research in Progress)

For certain classes of learners, under certain conditions, color may be a productive variable; for most, however, monochrome may do just as well.

f. "A Little Plain Talk About Television: Are You Sure It's What You're Looking For?" Under review by *Education, Communication, Technology Journal*. (Research in Progress)

g. "Notre Dame Our Mother: Reminiscences of Undergraduate Life by Twenty-four Distinguished Alumni." (Research in Progress)

Two dozen famous Notre Dame graduates discuss their years as undergraduates.

h. "Thos Hollowed Halls of Ivy: A Quick Look Back at Life as an Undergrad at Notre Dame." *Notre Dame Magazine* (forthcoming) (Article)

This is a nostalgic piece about undergraduate life at Notre Dame in the early to mid 1950s.

21. SHENK, Robert E. Commander and Assistant Professor

a. "The Liberation of the Loathly Lady of Medieval Romance." *Journal of the Rocky Mountain Medieval and Renaissance Association*, Vol II, No. 1 (forthcoming). (Article)

I argue that *The Wedding of Sir Gawain and Dame Ragnell* is a pointedly Christian romance, suggesting how both men and women can be liberated from their troubles by submission to Christ.

b. "Literature in the Education of the Military Professional." USAFA, CO: DFENG, 1981. (Research in Progress)

This research report consists of articles by department members dealing with the question as to why a military professional needs to have a good background in literature.

c. "Machinery and Meaning: The Achievement of Richard McKenna." 1981 (Research in Progress)

An examination of McKenna's works suggests he is a deeply philosophical writer and that he had an intriguing vision of man's condition, a vision based on McKenna's understanding of machinery. University of North Carolina Press is interested in this work.

d. "Our Vocation to Teach the Vocations: The Integration of Career Education with the Teaching of Literature and Writing." *Essays on Career Education and English, K-12*, National Council of Teachers of English, 1980. (Article)

Our vocation to teach English involves a commitment to introduce students to the great potentiality of meaningful work. One of the best ways of introduction is to have students read literature in which meaningful careers are

represented.

e. "Researching for Real: Connecting the Freshman Research Paper with Live Literary Research." Teaching the Research Paper, Conference on College Composition and Communication, Dallas, TX, March 1981. (Presentation)

I discuss the use of a full-length novel as a generator of ideas and interest for the freshman research paper. I base this presentation on work done in an experimental English 111 section, Spring 1980.

f. "Rev. of *To the Honor of the Fleet*," by Robert Pilpel. *Naval War College Review*, 33, #2 (Mar-Apr, 1980), 21-122. (Review)

g. "Rev. of *The Master Mariner: Running Proud*," by Nicholas Monsarrat. *Naval War College Review*, 32, #6 (Nov-Dec, 1979), 117. (Review)

h. "The Self Enlarged: The Case of Good Literature in the Composition Class." Using Literature, Wyoming Conference on Freshman-Sophomore English, Laramie, Wyoming, July 9, 1980. (Presentation)

Using literature as the subject matter in a composition class will not only enliven the class discussions and add interest to student writing, but can be justified in terms of rhetorical principles.

i. "The Wild White Horses of the Sun." *Journal of Career Education*, Vol 7, # 3, (forthcoming) 1981. (Article)

I suggest that literature is a good way to broaden students' visions of the potentiality of their vocations and of their lives.

22. SHUTTLEWORTH, Jack M., Colonel and Professor and Head

a. "The Influence of the Herberts on John Donne" 1983. (Research in Progress)

b. "A Newly Recovered Donne First Edition." *Seventeenth Century News*, 37, #3 & 4 (Fall, Winter 1979), 72. (Article)

c. "The Practical Researcher." New York: Holt, Rinehart (forthcoming) November 1980. (Textbook)

This textbook will guide students through the process of research and writing college and business research papers.

d. "Technology and Departments of English." Association of Departments of English, Spokane, WA, July 1980. (Presentation)

I discuss the effects of technological change upon Departments of English, including use of word processing, television, and microcomputers.

23. STONE, William M., Major and Instructor

a. "Student Writing in Three Aims of Discourse." Dissertation for University of Iowa, 1981.

(Research in Progress)

I analyze and describe successful writing performance (evaluated by primary trait scoring) in the expressive, referential, and persuasive aims of discourse.

24. STALEY, Robert S., II, Major and Assistant Professor

- a. "Charles Sanders Peirce and the Language of Science" 1981. (Research in Progress)

Peirce's views of the linguistic or semiotic nature of human reality foretell and clarify some of the modern theoretical physicists' most pressing dilemmas.

- b. "Rev of *Disturbing the Universe*, by Freeman Dyson." *Air University Review*, (forthcoming). (Review)

- c. "Satirical Commentary in Swift's *Tale of a Tub*." Boulder: University of Colorado, December 1979. (Dissertation)

I show that the notes to *The Tale of a Tub* are indeed Swift's.

- d. "'The Science of the Real': Peirce's Semiotics and Emerson's 'The Poet'." American Literature to 1900, Rocky Mountain Modern Language Association Conference, Albuquerque, NM, 18 October 1979. (Presentation)

- e. "Searching for Words": Peirce's Semiotics and Emerson's 'The Poet' " 1981. (Research in Progress)

(Accepted with revisions by *American Transcendental Quarterly*.) Emerson's "poetic" anticipates Peirce's later systematic exploration of linguistic creativity.

25. THOMSON, John M., III, Captain and Instructor

- a. "Editing the Literary Magazine." Media Conference, Western State College of Colorado, Gunnison, CO, 19 September 1980. (Presentation)

I shared ideas with other editors, both faculty and students, on the process of putting together an undergraduate literary magazine.

- b. "Rev. of *The Right Stuff*, by Tom Wolfe. *Air University Review*, (forthcoming) (Review-Article)

Aside from the information about the Mercury Astronaut Program, Air Force readers will enjoy *The Right Stuff* because Wolfe conveys so convincingly what it *feels* like to be a test pilot, astronaut, and member of the military.

- c. "The Theme of Honor and Fame in Selected Renaissance Poets." Dissertation for University of Iowa, December 1981. (Research in Progress)

26. TOMPKINS, Edwin S., Captain and Instructor

a. "Teaching English Fundamentals at the Air Force Academy." Freshman English, Colorado Language Arts Society, Colorado Springs, 13-16 March 1980. (Presentation)

b. "Teaching English Fundamentals at the Air Force Academy." Freshman English, Consortium of English, Gunnison, CO, April 1980. (Presentation)

Major Bud Kelley, Captain Jay Gaspar, and I shared our experiences, discoveries, and insights concerning the English 110 program. We concentrated on what kind of assignments to make, what factors to emphasize in grading, and what part reading plays in teaching writing.

27. WALLISCH, William J., Jr., Lieutenant Colonel and Tenure Associate Professor

a. "Back to See the Wizard." *The Journal of General Education*, 30, No. 4 (Winter 1979), 229-301. (Article)

b. "The Blue Tube." *Education and Industrial Television*, December 1979. (Article)

c. "The Electronic Revolution: A Warning." *Feedback*, 22, No. 2 (Aug 1980), 20-21. (Article)

d. "The First Permanent Professor Symposium." *Admissions Liaison Office Newsletter: The Dean's Digest*, USAFARP 1980-1, No. 12 (Dec 1979), p. 5. (Article)

e. "The House I Live In." USAFA, CO., 1980. (Multi-image Presentation)

The DF Academic Briefing. Multi-image presentation to visitors and VIPs.

f. "PILGRIMAGE." USAFA, CO, 1980. (Multi-media Presentation)

A multi-media and videotape program featuring James Dickey responding to AF experiences from WWII.

g. "Using TV Technology to Teach." *Educational and Industrial Television*, April 1980. (Article)

These articles (a, b, c, g) discuss various aspects of the instructional methods used in "Blue Tube."

CHAPTER K
Department of Foreign Languages

1. BUSH, Michael D., Captain and Assistant Professor of French

- a. *"Selected Variables in the Mathematical Formulation of a Model of Second-Language Learning.* Sponsored by the Ohio State University and by the USAF Academy. (Research)

For some years educators and linguists have attempted to explain why people learn a second language with varying degrees of success while all have learned a first language with no problem. This study investigated the relationship between second-language learning achievement and variables in the categories Intelligence, Experience, Demographics, Personality, Attitudes, Aptitude, and Perseverance. Not only are direct effects examined but interactions between categories of variables are identified and evaluated as well. Variables and interactions are being fitted into a statistical model using regression and factor analytical procedures.

- b. Dissertation, forthcoming. The Ohio State University, Columbus, Ohio. (Dissertation)

2. CRAWFORD, Walter T., Captain and Assistant Professor of Spanish

- a. *"A More Precise Definition of the Variable Semesters of Previous Study in Foreign Languages.* Sponsored by DFF. (Research)

Traditionally, placement in Foreign Language courses has in large part been based primarily upon previous study experience and scores on placement examinations. Experience has shown, however, that the number of semesters of foreign language study is often a poor predictor. This is due to the wide variation of courses at schools across the country as well as to the various levels of study possible within any given school system, i.e., high school, junior high school, elementary school. The purpose of this study is to identify and research other variables such as type of high school language teaching program, elapsed time since language study, and student assessment of previous programs of study that affect the significance of, semesters of previous study. A greater understanding of these types of variables will allow more precise measurement of previous study experience and thus more accurate foreign language placement.

3. FUJITA, James N., Major and Associate Professor of Japanese

- a. *"A Preliminary Inquiry into the Listening Strategies of Successful and Unsuccessful Second Language Learners in Beginning College Japanese."* Sponsored by the USAF Academy. (Research)

This study seeks to determine what students do in order to comprehend a listening comprehension passage in Japanese. A questionnaire and an interview were utilized to ascertain whether students take written notes, mental notes, use a combination of written and mental notes, etc. In addition, the interview seeks to determine how students prepare themselves to listen prior to hearing the passage as well as what they do during the first and second playing of the passage. The data is currently under investigation.

- b. Dissertation, forthcoming. The Ohio State University, Columbus, Ohio. (Dissertation)

4. HANNAWAY, Daniel, G. M., Lieutenant Colonel and Tenure Professor of Russian

a. *"Soviet Thoughts on Military Leadership."* (Article)

This paper attempts to give some insight into current Soviet military thinking on leadership by examining what high-ranking officers in the USSR hold to be the most important qualities a military leader can possess. The study centers on the six general requirements for effective leadership which were set forth by the late Marshall A. A. Grechko in his book *The Armed Forces of the Soviet State* (1975), and which have considerable significance for Soviet military leaders in the 1980s. By examining a number of Soviet military writings which touch on these requirements, it becomes quite evident that certain qualities are more important than others. Ideological conviction and patriotism, initiative and independence, and pedagogical expertise figure very prominently in the desired leadership qualities the present military leaders want to see developed in the younger officers as the latter move into increasingly responsible command positions in the years to come.

b. Hannaway, D. G. M., *"Soviet Thoughts on Military Leadership,"* presented at a Conference sponsored by the Assistant Chief of Staff/Intelligence, USAF - The Soviet Union: What Lies Ahead? Military - Political Affairs in the 1980s - Reston, VA, September, 1980. (Presentations)

5. ROWE, A. Allen, Major and Chairman of French Section
BUSH, Michael D., Captain and Assistant Professor of French

a. *"The Application of Information Processing Techniques in the Teaching of Foreign Language at the USAF Academy.* Sponsored by DFF. (Research)

The purpose of this research is to investigate the applicability of Word Processing, Computer Managed Instruction, and Computer Assisted Instruction in the preparation and presentation of course and testing materials in the Department of Foreign Languages. Preliminary results show these principles to have promise in improving the effectiveness of Department personnel as well as in improving the quality of instruction.

The effectiveness of Department personnel is being improved by increasing the amount of work produced with no increase in time expended. The quality of instruction is being improved by increasing information flow between faculty and students. Examinations, an integral part of the instruction process, are being improved by using these techniques (assessment of examination reliability, for example). Instructors are also provided with an increased quality of information on student performance. This feedback allows problems of individual students to be addressed more effectively.

CHAPTER L

Department of History

1. BISHOP, Donald M., Captain, USAFR and Thomas F. McGann*

- a. "World History in Liberal Military Education. December 1979. Published by the U.S. Air Force Academy. (Report)

The History Department has offered an undergraduate survey course in world history at the Academy since 1968. This course, "Europe and the World Since 1500," analyzes the interaction between major world regions since the end of the fifteenth century. Special emphasis is placed on the rise of Western European civilization and the impact of that civilization on other regions.

After placing the world history course in the foregoing thematic perspective, the report discusses the educational environment at the Air Force Academy and traces the conceptualization, development, and administration of the course by the Department of History.

*Capt Bishop served as instructor and assistant professor in the Department of History between 1975 and 1979; Dr. Thomas F. McGann served as the department's first Distinguished Visiting Professor during academic year 1978-1979.

2. BOROWSKI, Harry R., Major and Associate Professor

- a. "Air Force Atomic Capability from V-J Day to the Berlin Blockade—Potential or Real?" *Military Affairs*, 44 (October 1980), 105-110. (Article)

This article examines the U.S. air arm between 1946 and 1948 and demonstrates that its bombing capability and ability to wage atomic warfare was very limited. By focusing on actual capability, the article suggests that much past work on the Cold War needs re-examination. Most historians have assumed that the U.S. possessed greater military capability during this period than was, in fact, the case.

- b. "A Narrow Victory: The 1948 Berlin Blockade and the American Military Response." (Presentation)

I presented this paper in December 1979 at the annual meeting of the American Historical Association in New York. I examined U.S. military planning and capability on the eve of the 1948 Berlin Blockade and argued that both were found wanting. I contended further that the U.S. response was careful and cautious and was designed to allow room for a diplomatic settlement, largely because there was no other realistic alternative. My position on these questions contrasts rather sharply with the conventional interpretation of American reaction to the Blockade.

3. CONVERSE, Elliott V., III, Major and Assistant Professor

- a. "The American Military Establishment and the Creation of a Postwar Overseas Military Base Network, 1942-1948." Princeton (forthcoming). (Dissertation)

This study examines the planning by various sectors of the United States military establishment for an extensive postwar overseas base system and the military's efforts to have these plans implemented following World War II. My emphasis is on analyzing the adaptation of plans to changing forces and circumstances.

4. DIXON, Joe C., Captain and Assistant Professor

- a. "Defeat and Disarmament: A Study of Austrian Military Affairs, 1918-1921." Dissertation University of Minnesota 1980. (Dissertation)

The principal theme of my study is disarmament in central Europe after World War I, with a focus on Austria. Austrian military affairs after World War I were dominated by the victorious Western powers who attempted to impose disarmament on Austria. Austrian political instability, economic devastation, the Bolshevik threat, quarrels among the allies, and refusal of the Austrian population to give up private stores of arms complicated this task. My study analyzes the ultimate failure of Allied policy, which permitted and finally stimulated the rise of private political armies representing the socialist left and the fascist right within Austria.

5. HALL, Dennis G., Captain and Assistant Professor

- a. "Hair and the Air Force." *Air University Review* (forthcoming in 1981). (Article)

This article examines why the Air Force is suffering such an alarmingly high attrition rate among its pilots.

- b. "The Soviet Threat." (Presentation)

I spoke before a luncheon meeting of the Colorado Springs SETOMA Club on 7 August 1980. My presentation outlined the dimensions of the growing Soviet threat.

6. HURLEY, Alfred F., Brigadier General (Ret) and former Head*

- a. "The Evolution of Military Airpower Down to World War II." (Presentation)

Gen. Hurley read this paper to an audience at the Army War College on 13 March 1980. General Hurley's presentation served as the opening lecture and seminar in an elective course on the history of air power.

- c. "Is There an American Way of War?" (Presentation)

Gen Hurley delivered this paper at Chadron State University, Nebraska, on 16 April 1980. This presentation addressed American attitudes toward war and the military with special emphasis on the tradition of civilian control and the role of the citizen-soldier in the American military experience.

- c. "The Role of Air Power in World War I." (Presentation)

Gen Hurley made this presentation at the Air War College in October 1979. His paper treated the employment of airpower in World War I as a seedbed experience in the history of military aviation.

*Gen Hurley retired from the Air Force in August 1980.

7. MANK, Russell W., Jr., Major and Tenure Associate Professor

a. "The History of the USAF Academy Through Oral History." (Presentation)

I presented this paper to the Colorado History Group at their fall meeting on 27 October 1979. The paper explains how the Academy was created, describes some of its growing pains, and offers a description and analysis of some of the founding fathers. I based the paper largely on oral history memoirs.

8. NORVELL, John E., Major and Assistant Professor

The Department of History conducted the following oral history (interviews) during the period 1 October 1979 through 30 September 1980:

a. Dahl, Perry J., Colonel, USAF (Ret)

As a P-38 pilot in World War II, Col Dahl provides much valuable information on fighter operations, missions in the Pacific theater, and experiences as a downed flier evading the Japanese.

b. Galligan, Walter T., Lieutenant Colonel, USAF (Ret)

Gen Galligan discusses his tenure as Commandant of Cadets at USAFA from 1971 to 1973.

c. Rafalko, Edmund A., Major General, USAF (Ret)

Gen Rafalko discusses his tenure as Athletic Director at USAFA from 1963 to 1967.

d. Stillman, Robert, Major General, USAF (Ret)

Gen Stillman discusses his tenure as the first Commandant of Cadets at USAFA.

e. Sullivan, Henry R., Major General, USAF (Ret)

Gen Sullivan discusses his tenure as Commandant of Cadets at USAFA from 1958 to 1961.

f. Williams, John M., Colonel, USAF (Ret)

Col Williams was one of the original Flying Tigers. He discusses that outfit's operations during World War II.

9. REDDEL, Carl W., Lieutenant Colonel and Acting Head

a. "The Marxist-Leninist View of the Human Resource in War." (Presentation)

I delivered this paper at a conference sponsored by the ACS/Intelligence on "The Soviet Union: What Lies Ahead?" The conference was held in Washington, D.C., on 25-27 September 1980. My presentation focused on the central role of human beings in the Marxist-Leninist view of modern war and examined the problem in three phases or steps:

1. A discussion of the significance of ideology for the Soviet military professional.
2. A survey of the Soviet view of human conflict.
3. An examination of the specific meaning of "human resources" to the Soviet military.

My paper emphasizes the Soviet capacity to organize its human resources for war and the hazards of underestimating this capability.

b. "Soviet Military Districts in the Wartime Mode." (Presentation)

I participated in a workshop on this subject in Washington, D.C., 13-14 September 1980. Chaired by Professor John Erickson of the University of Edinburgh, members of the workshop made presentations on the Soviet military district as the key organizational device through which the Soviet state administers manpower, manning, and mobilization for war.

10. SEMMENS, Paul, Major, USA and former Assistant Professor

a. "Dare to Decentralize: Army Air Defense in the Air Superiority Battle." (Presentation)

Maj Semmens made this presentation at the Air University Airpower Symposium on 3-5 March 1980. His paper argues that present USAF doctrine inhibits Army Air Defense fires by complicating the identification process. As a result, the reaction time for Army fire units is significantly reduced. Unless this situation is corrected by establishing weapons free zones over portions of the battlefield, army units will not have the air superiority necessary to move laterally—a capability vital in the Army's active defense.

b. "Ready Now." *Air Defense Magazine* (July-September 1980), pp. 25-26. (Article)

"Ready Now" is the story of the first American combat unit to see action in the Korean War, an element of the 507th Anti-Aircraft Artillery.

*Major Semmens served as the Army Exchange Officer in the Department of History from 1977 to 1980.

11. SHINER, John F., Lieutenant Colonel and Tenure Associate Professor

a. "The Air Corps, the Navy, and Coast Defense, 1919-1941." (Presentation)

I presented this paper at the Northern Great Plains History Conference, University of Winnipeg, Winnipeg, Canada, 12 October 1979. The paper analyzes the continuing debate between the Air Corps and the Navy over responsibility for the coast defense mission. Both organizations claimed that mission was their own exclusive preserve, and each was unwilling to cooperate with the other. Yet, neither the Air Corps nor the Navy was able to do the job alone. The successful Japanese attack on Pearl Harbor was one consequence of this rivalry. There is a message here for our armed services today. A revised version of this paper will be published in *Military Affairs* early in 1981.

b. "The Army Air Arm of the 1920s and 1930s: Opportunities and Sources." (Presentation)

I delivered this paper at the Air Force Historical Foundation Technical Session, Washington, D.C., 4 April 1980. I discussed with civilian scholars and military members of the Air Force Historical Society the need for further research and writing on military aviation during the inter-war period. My goal was to stimulate additional scholarship by describing the extensive work that remains to be done on this period in order for the Air Force to understand its heritage. I also reviewed the numerous sources available for such work.

c. "The Combined Bomber Offensive." (Presentation)

I presented this lecture to an interdisciplinary course on World War II at Utah State University, Logan, Utah, 14 February 1980. I described the problems faced by the Royal Air Force and the U.S. Army Air Force in translating pre-war air doctrine into reality. I also discussed the effectiveness of the strategic bombing campaign against

Germany once the two air forces had resolved their doctrinal problems.

d. "The History of the United States Air Force." (Presentation)

Together with Captains Dennis Hall and Andrew Smoak of the History Department, I lectured to the 7th Annual High School Aerospace Education Symposium, Lowry AFB, Colorado, 11 January 1980. The three of us gave a three-hour presentation on the history of the Air Force from 1903 to the present. Our audience consisted of 250 Civil Air Patrol cadets and high school AFROTC students from three states.

e. "The U.S. Strategic Bombing Campaign Against Germany." (Presentation)

I made this presentation to the Pueblo, Colorado, Chapter of the Air Force Association on 29 November 1979. I described the problems that confronted the U.S. Army Force, their resolution, and the ultimate success of the U.S. strategic air campaign against Germany.

12. SMOAK, Andrew W., Captain and Assistant Professor

a. "Professional Military Education and Leadership." (Presentation)

I delivered a paper at the 1980 Air University Airpower Symposium at Maxwell Air Force Base, 3-5 March 1980. The symposium theme addressed the problem of NATO forces facing superior Soviet forces in an European confrontation. By comparing Soviet PME to the American system, I warned that our assumption of superior military leadership might be fallacious.

13. SHAW, Bryant P., Captain and Instructor

a. "A Bibliography of African Military History," (forthcoming). (Bibliography)

I based this unannotated bibliography almost entirely on sources available at the USAF Academy library. The bibliography is not exhaustive; its purpose is to demonstrate to the cadets the nature and scope of a relatively new field within third world military history. I have divided the bibliography into four sections: the precolonial period (to c. 1850), the colonial period (c. 1850-1960), the independence period (c. 1960 to the present), with a special section on the role of foreign military assistance to the African nations. The research on the bibliography has revealed that the independence period has attracted the most attention from military historians with the colonial period a close second, and the pre-colonial period a very distant third. I have not included the nations of North Africa in this bibliography.

14. SPIRES, David N., Major and Associate Professor

a. "The Career of the Reichswehr Officer, 1921-1933" (forthcoming). (Book)

This forthcoming book will examine the Versailles Treaty German Army from the inside by focusing on various officer programs. I show that the professional army of Weimar Germany offers instructive parallels for today's professional military, and that the internal problems facing Reichswehr leaders affected crucial political decisions taken in the years immediately prior to Hitler's seizure of power.

b. "The Education and Training of German General Staff Officer Candidates, 1921-1933." (Presentation)

I presented this paper at the Citadel's Symposium on Hitler and the National Socialist Era, 24-25 April 1980. By discussing the General Staff training program, I demonstrated that the narrow technical-tactical orientation of the program fostered the conformist attitudes of the specialist rather than the broad, independent outlook of the generalist. The Citadel is considering publishing my paper as part of the Symposium proceedings.

15. TILFORD, Earl H., Jr., Captain and Instructor

- a. "The Development of Search and Rescue in Southeast Asia, 1961-75." *Air University Review*, 21 (January-February 1980), 61-74. (Article)

This article summarizes my forthcoming (July 1980) book on the development of SAR in Southeast Asia. The Air Force was unprepared for the kinds of rescue operations it had to conduct in SEA. However, the ingenious application of technological advances in helicopters and the evolution of tactics, which took advantage of geographic features, made aircrew rescue a reality. I make the point that rescue from heavily defended open areas was virtually impossible. I raise the question of the future of combat rescue in the heavily-defended, relatively open areas of Europe, the Mideast, and Korea.

- b. "Two Scorpions in a Cup: America and the Soviet Airlift to Laos." *Aerospace Historian*, 27 (Fall, 1980), 151-161. (Article)

In the early 1960s the United States and the Soviet Union secretly supported opposing sides in the 3-way civil war in Laos. This article addresses Soviet intentions within the context of the, then unknown to the West, split between China and the USSR. I trace air operations, including air drops by "Aeroflot" IL-14 transports and Air America planes, against the background of political competition in Vientiane; the royal capital, Luang Prabang; Phnom Penh; Cambodia; Washington; and Moscow.

16. TITUS, James, Major and Assistant Professor

- a. "Soldiers When They Chose To Be So: Virginians at War, 1754-1763." Rutgers (forthcoming). (Dissertation)

I am studying how the largest English colony in North America waged war in the mid-eighteenth century. My plan is to use the Seven Years' War as a lens for bringing into sharper focus the social and political culture of the Old Dominion.

CHAPTER M

Department of Law

Law for Commanders and Introduction to Law. 1980

These instructional textbooks, with supplemental notebooks, were prepared by members of the Department of Law for use in Law 400 and Law 300, respectively. Both written on an undergraduate instructional level, *Law for Commanders* deals with substantive criminal law, both civilian and military, criminal evidence, and international laws of war. *Introduction to Law* is strictly a civil law text addressing property law, torts, contracts, and selected constitutional issues. Both texts are sprinkled with excerpts from actual caselaw to give the cadets a feeling for the method of creating and interpreting laws used in our common law system.

1. EMERSON, Michael, R., Major and Associate Professor of Law

a. "Copyright and Patents Opinions." (Research)

I conducted research into copyright and patent implications of works used and produced by faculty members.

2. JOHNSON, Phillip A., Major and Tenure Associate Professor

a. "Personal Estate Planning," *Air Force Law Review* forthcoming. (Notes)

This research in assorted estate planning topics resulted in major revisions to the program of estate planning lectures presented by DFL members to Air Force organizations. The material is expected to be incorporated into a training program for Air Force legal assistance officers.

b. "Personal Estate Planning." (Presentation)

These Personal Estate Planning seminars centered on topics such as government survivor's benefits, insurance, investments, and wills and trusts. Three hours in length, the seminars were designed not as definitive estate planning tools, but as means of raising and discussing some of the more common estate planning problems, as well as the options and benefits available to members of the military community.

Hickam AFB, HI, 12-19 September 1980
Kirtland AFB, NM, 11-12 February 1980
Robins AFB, GA, 5-7 May 1980
Holloman AFB, NM, 15-17 July 1980
United States Air Force Academy Departments
Wright-Patterson AFB, OH, 28 April-1 May 1980

3. KINEVAN, Marcos E., Colonel and Professor and Head

a. "Personal Estate Planning, New Jersey: Prentice-Hall, Inc., 1980. (Book)

Colonel Kinevan's book first addresses the problems of accumulating an estate while trying to avoid the financial pitfalls which can seriously (and needlessly) deplete an estate. It then deals with methods and problems of distributing that estate as our time to enjoy it on a carnal level grows short. It presents a good deal of substantive information, as well as sound advice on the practical aspects of saving and investing. If this book doesn't tell you

exactly what you need to know about personal estate planning, at least you'll know which questions you should be asking.

b. "Personal Estate Planning." (Presentation)

Vandenberg AF, CA, 13 December 1979

4. McILWAIN, Merrell S., II, Captain and Assistant Professor

a. Copyright and Patents Opinions." (Research)

I conducted research into copyright and patent implications of works used and produced by faculty members.

b. "Faculty Acceptance of Grants, Fellowships and Aid for Summer Research." (Research)

I conducted research into statutory and regulatory restrictions on faculty members accepting grants, fellowships, or other remuneration from non-Air Force sources for various summer activities.

c. "New Military Rules of Evidence" *Air Force Law Review*, forthcoming. (Article)

I conducted research on the constitutionality of the new rule of evidence allowing searches of dormitories without probable cause.

5. SCHAEFER, Robert L., Major and Associate Professor

a. AFIT School of Systems and Logistics, Wright-Patterson AFB, OH. (Lecturer)

Topics: "Christian Doctrine" and "Recent Events in Government Contract Law" 16 and 26 September 1980.

b. "Class of '82 automobile lecture." (Presentation)

This lecture addressed problems which cadets historically face when purchasing new cars. Major Schaefer spoke primarily on problems related to contract law: formal requirements, rights of the parties, warranties, clauses unique to automobile sales, etc. He also discussed problems of registration, taxes and insurance, and the various options available to military persons to help ameliorate some of those problems.

6. SUCHER, Mark L., Captain and Assistant Professor

a. "Estate Planning Seminar," DFACS. (Presentation)

b. "Government Procurement Law." (Research)

p101 conducted research in government procurement law pertaining to notice required to be given to the government by contractors seeking equitable adjustments in contract provisions.

7. VAN NESS, James G., Captain and Assistant Professor

- a. "Copyright and Patents Opinions." (Research)

I conducted research into copyright and patent implications of works used and produced by faculty members.

- b. "Estate Planning," Hickam AFB, HI. (Presentation)

- c. "New Military Rules of Evidence" *Air Force Law Review*, forthcoming. (Article)

I conducted research on the constitutionality of the new rule of evidence allowing searches of dormitories without probable cause.

8. VENTO, John S., Captain and Assistant Professor

- a. "Harry Weinberger" *Journal of Legal History* forthcoming. (Article)

I conducted research on the career of civil liberties attorney Harry Weinberger.

9. WILSON, Robert J., Jr., Major and Tenure Associate Professor

- a. "The Honor Code Ethical Problems," Fall Seminar USAFA Series, 9 September 1980. (Presentation)

- b. "Personal Estate Planning" *Air Force Law Review* forthcoming. (Notes)

I conducted research in assorted estate planning topics, resulting in major revisions to the program of estate planning lectures presented by DFL members to Air Force organizations. The material is expected to be incorporated into a training program for Air Force legal assistance officers.

- c. "Personal Estate Planning." (Presentation)

Wright-Patterson AFB, OH, 28 April-1 May 1980.
United States Air Force Academy Departments

ADDITIONAL CONTRIBUTIONS:

BUNGE, Kenneth E., Major and Associate Professor

"Current Constitutional Issues," March 1980 to the Graduate Scholarship Program. (Presentation)

HENABRAY, William B., Major and Associate Professor

ECON 374 - European Economic Community (Lecturer)

POLI SCI 232 - Law of Armed Conflict

POLI SCI 200 - Comparative Politics-England

Graduate Scholarship Seminars:

- Constitutional Law
- Contemporary Social Issues

SCHMIDT, William G., Captain, Assistant Professor

"Estate Planning Seminar" DFAN, 30 September 1980. (Presentation)

CHAPTER N
Department of Mathematical Sciences

1. KIEMELE, Mark J., Captain and Instructor

a. "Math 132 Test Retest Strategy." (Research in Progress)

Math 132 in 1980 incorporated a test-retest strategy whereby a cadet could take a retest for each of the five Graded Reviews (GRs). There was no penalty in retesting in that, if a cadet retested, the higher of the original GR score or the retest score was recorded as the cadet's score on any particular GR. The retests, in general, were more difficult than the original GRs, and each problem on a retest was graded either all right or all wrong. The purpose of my research is to determine any effects of this test-retest strategy on cadet outcomes.

I have calculated the basic statistics of the retest data accumulated during the 1980 Math 132 course. We now know that, on the average, 65% of the cadets took the retest. Fifty-four (54) percent of those who took a retest improved their scores; thus, 35% of the total number of cadets in the course improved their scores on a given GR. The average improvement rate for those who improved their scores was 17.5%. The overall effect of retesting on the course average was that it improved the course average by at least 3.42%.

Currently, we are developing a methodology to assess any trends as to which aptitude levels retests benefit most and whether cadets relied on retests at the expense of preparing for initial tests.

2. LITWHILER, Daniel W., Jr., Lieutenant Colonel and Associate Professor

a. "Steiner's Problem and Fagnano's Result on the Sphere." *Mathematical Programming* 18 (1980), 286-290. (Article)

I discuss geometrically appealing results which are necessary conditions for optimum solutions to the spherical Steiner-Weber location problem and spherical analog of known planar results.

3. McLELLAN, Allen C., Captain and Instructor

a. "Self Reported Affective Data as Predictors of Mathematics Achievement." (Research in Progress)

Placement into the proper initial mathematics course for USAFA cadets is a complex process that involves analysis of a cadet's ACT and SAT scores, USAFA-computer academic composite, department-administered examinations, and reported mathematics background. Everyone agrees that how a cadet performs in math depends on attitude and motivation as well as previous math achievement, but no attempts have been made to measure attitudes toward math or cadet motivation to study. For the Class of 1984, I asked each student 20 questions designed to sample attitudes and motivation. After the Fall 80 semester, I will correlate responses to those questions with the grades in the students' first USAFA math course. The goal is to determine the extent to which self-reported affective data can predict mathematics achievement. If the affective data improve predictability, improve the accuracy of our placement will be improved.p11112

4. MONACO, Salvatore J., Major and Associate Professor

a. "CHAMPUS Reimbursement Policy." (Research)

I have evaluated the projected costs for a proposal to put a yearly upper limit on what families would pay for CHAMPUS care for the Office of CHAMPUS, Denver, CO.

b. "Software Failure Prediction." (Research)

I have completed multiple regression models to predict software failures for Rome Air Development Center, Griffiss AFB, NY.

5. NELSON, David A., Captain and Associate Professor

a. Image Processing System Defense Mapping Agency (DMA)/USAFA Research and Development Program. (Research in Progress)

DMA purchased an Image Processing System which will be used to investigate approaches to three-dimensional model generations of urban scenes from digital stereo images. Current plans call for automating this model-generation process so that it can be applied to both the terminal-homing phase of advanced weapons systems and the production of maps.

6. THOMPSON, Samuel B., Major and Assistant Professor

a. "Daily Quizzing (DQ) Experiment." (Research in Progress)

At the Air Force Academy, incentives for cadet academic effort outside the class have been a perennial source of controversy. A widely used incentive, "daily" quizzing, has been employed, both voluntarily and by mandate from time-to-time throughout the history of the institution. While the relative effectiveness of daily quizzing as an outside study incentive and its relative cost in administrative overhead have been hotly debated, they have not been objectively and conclusively determined. We are currently conducting a definitive and, hopefully, conclusive experiment to evaluate this controversial practice in the core math program. We have randomly assigned twenty cadet squadrons (about 470 fourthclass cadets) to a daily quizzing treatment in Math 131. The remainder are in a control treatment with much less frequent quizzing. We have carefully balanced or otherwise controlled extraneous factors such as instructor experience or cadet aptitude, which could influence outcomes. Measured outcomes include math achievement, cadet study time, extra instruction, instructor workload, and attitudes. We intend to publish a comprehensive final report in the Spring 81 semester.

7. WEBSTER, Russell J., Captain and Associate Professor
THOMPSON, Samuel B., Major and Assistant Professor

a. "Your Grade is Slipping. I Guess you will Have to Study More." (Research in Progress)

This common cure notwithstanding, there is evidence to suggest that there maybe no correlation between the amount of study and the grade in core mathematics courses.

We have collected a wealth of study time data in core math courses the past three years and are analyzing this data to determine the correlation between study time and grades earned with and without adjustment for aptitude. Also, we are investigating the variation in daily study times to see if there is any correlation between grade and consistency of daily study time.

We expect to complete all analysis by 31 December 1980.

CHAPTER O
Department of Philosophy and Fine Arts

1. DAVENPORT, Manuel M., Distinguished Visiting Professor

a. "Code of Ethics for the Professional Secretary." (Consultant)

From February through July 1980, I served as consultant for the National Secretaries Association (International) assigned to draft and edit a code of ethics. The Association adopted this code at its 1980 International Convention in July and published it in August. In the year ahead, at the request of the National Secretaries Association, I will write a casebook to illustrate and supplement the code.

b. "Fall Seminar Series: USAFA Seminar for Scholarship Applicants." (Presentation)

On 9 September 1980, I led a discussion with cadets and staff on "Ethical Problems and the Honor Code," which focused on the question "Should we have an Honor Code because it pays off or because it establishes rules for proper behavior?"

c. "Honors Faculty Institute," sponsored by Colorado School of Mines and the United States Air Force Academy. (Participant)

I participated in this institute, designed to assist engineers in the teaching of humanities, as a representative of the Academy from 17 August through 21 August 1980.

d. "The Post-Existential Blues," *Cross Currents* 30 (1980), 1-11. (Article)

This article describes the contemporary status of existentialism as a philosophy and seeks to explain why it no longer provides guidance for dealing with today's moral problems.

2. DIXON, James B., Major and Assistant Professor

a. "A Critical Examination of Michael Walzer's Just War Theory." (Dissertation)

In the paper, I examine in some detail Professor Walzer's theories of justified wars and justified means in time of war. I begin with what I take to be morally significant in his just war theory; namely, that wars and means in time of war are justified if, and only if, they respect the rights of persons. Consequently, Walzer's conception is correct to the extent that it places at the center of our moral worry about war the rights of persons and mistaken to the extent that it fails to do so. I presented this paper to the Department of Philosophy at the University of Arizona in the Summer of 1980.

3. FAWKES, Donald A., Captain and Assistant Professor

a. "The Concept of Congruence" (Topic: Relativity Theory and Philosophy). (Presentation)

More than forty years before Einstein developed the General Theory of Relativity (GTR) the philosopher Henri Poincaré demonstrated that *if* some future scientist should develop a theory of physics that included a non-Euclidean geometry as the description of physical space, *that* there would be also an equivalent alternative theory that described physical space in a Euclidean way. In fact, Poincaré showed that there would be at least three equivalent

alternative theories employing the three geometries. The GTR is just such a theory. We can eliminate one of the three consequent theories by Occam's razor (principle of simplicity). But then we are faced with the problem that there are two equivalent theories, and we must choose between them. Now each theory predicts the same observations but gives a different description. So which one is true? My paper addresses this problem and argues that it can be solved. The solution involves an analysis of the concept of congruence; the paper is a preliminary inquiry to be followed by a complete investigation in a Ph.D. dissertation. I presented the paper to members of the faculty and staff at a Department of Physics Friday Afternoon Colloquium (FACT) talk on 22 February 1980.

b. "Physics, Space & Geometry." (Research)

More than forty years before Einstein developed the General Theory of Relativity (GTR) the philosopher Henri Poincaré demonstrated that *if* some future scientist should develop a theory of physics that included a non-Euclidean geometry as the description of physical space, *that* there would be also an equivalent alternative theory that described physical space in a Euclidean way. In fact, Poincaré showed that there would be three equivalent alternative theories employing the three geometries of constant curvature *and* an infinite number of equivalent alternative theories employing the infinite variety of geometries of nonconstant curvature. Each alternative theory would employ a different convention concerning congruence (i.e., a different convention concerning the length of separated physical measuring devices, e.g., meter sticks or "lightmeters"). The alternative theories are said to be equivalent descriptions of the universe because each predicts exactly the same observational and experimental consequences: *no* empirical result *can* confirm one while disconfirming the others: there is no possible "crucial test."

The GTR describes physical space as Riemannian of nonconstant curvature (a non-Euclidean geometry). Now, given the equivalent alternative theories, the question that arises for philosophy is, "Which one is correct?" Einstein was well aware of this question and answered it *pragmatically*, for the practicing physicist, in terms of computational unity, elegance, and computational simplicity. But Einstein also recognized that it would be pure anthropomorphic prejudice to presume that these considerations prescribed the way the universe must be. This *should not be confused* by the psychological fact that Einstein "felt" confident that the GTR is uniquely correct. As Einstein clearly recognized, feelings do not constitute evidence.

This topic is not the professional concern of the physicist (though it may be his concern as a hobby), because no empirical result is relevant to the resolution of the problem. My research is directed toward conceptual understanding of the issue, and his thesis may be stated as the view that the GTR is uniquely correct given present confirming evidence. My research also involves the related (and more "physics-like") questions concerning the cosmology of the universe and also the related (and even more philosophical) questions of (1) whether physical space is "substantial" or "relational" and (2) what are the "ontological commitments" of the GTR; i.e., exactly what basic entities are required by the theory. (The notion of a "gravitational field" is the most controversial example here.)

4. STAYTON, William H., Lieutenant Colonel and Associate Professor

a. "Basic Indian Religious Concepts." (Presentation)

Speaking to a study group of Divine Redeemer Catholic Church on 9 April 1980, I introduced those ways of thinking about God, people, and the world which are prevalent in India today. The emphasis was on the uniqueness.

b. "Buddhism." (Presentation)

I led a study on 30 October 1979, in which a group from Divine Redeemer Catholic Church looked at the theory and practice of Buddhism in China, Japan, and Southeast Asia. Of primary interest was the claim and the implications of

the claim that there is "no self."

c. "Buddhism." (Presentation)

This lecture-discussion on 15 January 1980, to a humanities class at Air Academy High School, related basic Buddhist teachings to culture and life-styles in Southeast Asian countries.

d. "Buddhism." (Presentation)

Speaking to a social studies class on 12 February 1980, at Air Academy Junior High School, I tried to make Buddhism "live" by focusing on how its strange-sounding doctrines really express common human needs.

e. "Buddhism." (Presentation)

This talk, on 23 April 1980, to a study group of Divine Redeemer Catholic Church, covered the life of the Buddha, his teachings, and the major divisions that came about in the religion after his death.

f. "Hinduism." (Presentation)

On 23 October 1979, I led a study group of Divine Redeemer Catholic Church in a look at the Hindu religion. We considered the concepts of God, sin, salvation, and afterlife. We also considered the impact of Hinduism on Indian society, e.g., the caste system.

g. "Hinduism." (Presentation)

The focus of this talk on 16 April 1980, to a study group of Divine Redeemer Catholic Church was on the development of the Hindu religion from 2500 BC to the present. The vehicle used was Hindu scripture. We looked at the various scriptures in terms of content, purpose, and continuity with past revelations.

h. "Indian Religions: Basic Concepts." (Presentation)

I began a study series at Divine Redeemer Catholic Church on 16 October 1979, with a very general look at how people in India understand nature, people, time, and God. The aim was to induce a mild state of culture shock and to interest the group in subsequent lessons.

i. "Japanese Religion." (Presentation)

I developed this talk for and presented, on 16 and 19 November 1979, to students in a Japanese language class at the USAF Academy. I covered primitive Japanese religion and the subsequent influences on it by Confucianism, Buddhism, and Christianity.

j. "Judaism." (Presentation)

Wrapping up an extended study of religions of the world, I spoke to a study group at the Black Forest Baptist Church on 7 and 14 October 1979, about the beliefs, practices, and historical development of Judaism.

k. "Judaism." (Presentation)

The aim of this talk, on 14 February 1980, to a social studies class of Air Academy Junior High School, was to use the thread of "suffering" to tie together the history of the Jews and to give content to Jewish beliefs about God, people, and the relationship between them.

l. "Transcendental Meditation." (Presentation)

The study group of Divine Redeemer Catholic Church in Colorado Springs concluded its look at world religions on 13 November 1979, with a stimulating discussion of Transcendental Meditation. A subject of particular interest was how a Christian should respond to this movement.

m. "The World of Islam." (Presentation)

I spoke to a study group of Divine Redeemer Catholic Church on 30 April 1980, about the founder, teachings, and divisions within Islam. A good deal of discussion revolved around Shi'a Islam—the minority position out of which Khomeini comes.

n. "Zen Buddhism." (Presentation)

This particular variety of Buddhism is of interest because it is very influential in Japanese cultural development. Also, many spokespersons for the counterculture in the 1960s relied on Zen insights. On 6 November 1979, I conducted this study for a group of Divine Redeemer Catholic Church of Colorado Springs.

5. WAKIN, Malham M., Colonel and Permanent Professor

a. "An Adventure in Moral Reasoning." (Presentation)

I gave this lecture to the student body and instructors at Air Command and Staff College, Maxwell AFB, on 17 September 1980. The paper reviewed popular and classical moral positions including relativism, egoism, Utilitarianism, early Greek views, and the positions of Hobbes and Kant.

b. "The End of the World as We Know It." (Presentation)

I was the principal speaker at the National Prayer Breakfast for Hill AFB on 7 February 1980. The paper I delivered dealt with predictions that the world would be divided into two camps within five years and with reflections on which of these camps we might find ourselves. In the essential theme was private versus public morality or concern for self versus acceptance of moral responsibility in public service.

c. "Ethics and Leadership." (Presentation)

I addressed the students and instructors at the Air War College, Maxwell AFB, on 25 February 1980 stressing the theme that the line between incompetence and immorality is a thinner line in the military profession than in almost any other vocation. Support for this thesis comes from an evaluation of the everyday functioning of the military profession, the high cost in human life and national treasure of military incompetence, and the ultimate purpose of the profession.

d. "Ethics and the Military Profession." (Presentation)

I gave versions of this two-hour lecture several times during FY 1980, including twice at the Armed Forces Staff College, Norfolk, VA (2 Oct 79 and 10 Mar 80); the Cadet Professional Ethics Committee at USAFA (4 Jun 80); a five-hour version for Army ethics instructors at a retreat house on Staten Island, NY (29 Oct 79); short version to USAFA Officer Ethics Advisors (15 Oct 79); three-hour version at the U.S. Army War College, Carlisle Barracks, PA (11 May 80). The presentation in its various forms dealt with concerns for moral standards in American society and in the unique setting of the military profession. I made comparisons with other distinguished professions, dealt

with the harm done by exaggerated zero-defects attitudes (the demand for perfection) and other institutional pressures, examined ways in which moral character is developed and ethical standards fostered in the military environment, and discussed absolutism and relativism in ethics.

e. "The Future of the Military Profession." (Presentation)

This discussion was part of the evening lecture series sponsored by the Professional Development Club at USAFA and attended mostly by cadets interested in graduate scholarships (4 Dec 80). The lecture reviewed various conceptions of professionalism, the possible nature of future wars, the changing demands on officership, and civil-military relationships.

f. "Islam." (Presentation)

This lecture, given at Air Academy High School on 17 Jan 80, reviewed the beginnings of the Muslim faith, the life of Mohammed, and fundamental teachings of Islam.

g. "Man as a Person." (Presentation)

I gave this three-hour presentation on the nature of man during the opening week of the academic year at the Inter-American Defense College, Washington, D.C. (9 Sep 80) as foundation for many of the topics they study during their course. The lecture took a brief look at the view of man held by Eastern thinkers (Hinduism, Buddhism, Taoism); examined the classic Greek positions (Socrates, Plato, Aristotle); reviewed the Judeo-Christian contributions, largely as contained in Augustine and Aquinas; and dealt with Hobbes, Nietzsche, Kant, the Existentialists, and Marx. I placed special emphasis on a comparison of Marxist and Judeo-Christian views of the nature of man.

h. "Managerial Integrity." (Presentation)

I gave this two-hour lecture for the Advanced Personnel Management Course at Maxwell AFB, AL, three times this year (11 Jan 80, 26 Feb 80, 17 Sep 80). The seminar-type lecture reviewed moral issues in American society, the unique nature of moral concerns for military managers, specific cases involving superior-subordinate relationships, the nature of character development, and the fundamental ethical dimensions of the military profession.

i. "A Rational Look at the Morality of War." (Presentation)

I gave this lecture as part of a series for the Academy Happenings Program, a Catholic adult Sunday morning series held in Fairchild Hall (4 Nov 80). I distinguished between morality *of* war and morality *in* war, reviewed classical notions of just war and the fundamental rights of nations, analyzed the pacifist position, evaluated *total* war in the modern context, and suggested that a shift in the military function has taken place in recent years because of the changing nature of war.

j. "Science, Technology, and Ethics." *Science, Philosophy, Religion*, Symposium VII, Air Force Weapons Laboratory, Kirtland AFB, NM, 1979. (Presentation)

I delivered the paper as part of the Weapons Laboratory's Symposium VII, 11-13 October 1979; and the paper was published in 1980 in the proceedings which were entitled *Science, Philosophy, Religion*. The paper contrasts the "objectivity" of science with the "subjectivity" of values and concludes that neither science nor technology are value-free. I discussed the "evils" of science and technology with some hints concerning how we arrived at our present dilemma. I make some strong suggestions concerning the decision-making process of technologists which is not allowed to be viewed as morally neutral.

I delivered a version of this paper in the Academy Physics Department's lecture series (FACT) on 19 Oct 80. It was titled, "The Ethical Physicist."

k. "The Soldier's View of Death." (Presentation)

I delivered this three-hour lecture to students and faculty members at King's College, London, Ontario, Canada on 14 November 1980. I traced some earlier romantic views of death in war prior to 1914 (Kipling, Henley, Rupert Brooke), switching to more realistic views after the horrors of World War I (Sassoon, Wells, etc.). I made use of S. L. A. Marshall's *Men Against Fire* and his observations of men in battle in World War II as well as Glenn Gray's sensitive treatment of this subject in *The Warriors*. These sources, plus my own experiences in Vietnam and Kubler-Ross's findings concerning the five stages of dying, provided several approaches to the sensitive question of how men approach death in war.

l. "Teaching Professional Ethics." (Presentation)

This was the keynote speech for the Joint Service Conference on Professional Ethics sponsored by the Air Command and Staff College at Maxwell AFB, AL, 9-11 January 1980. I asked what it means to say we "teach" ethics, suggested what I thought ethics courses can accomplish, pointed up the difficulties of dealing with professional ethics in the environment of training schools, made some suggestions about character development, indicated useful materials, and highlighted the importance of the task of the professional ethics teacher in the various military contexts represented by conference participants.

6. WENKER, Kenneth H., Lieutenant Colonel and Tenure Associate Professor

a. "Managerial Ethics." (Presentation)

This presentation summarizes continuing research into the nature of professional ethics, with emphasis on its application to managers in federal service. I show that ethics cannot be separated from an autonomous, rational morality; and I point out tendencies to overlook various ethical demands in the course of daily activities. Presentations: 23 October 1979, Colorado Springs, CO, Logistic Assistance Program Workshop, U.S. Army Materiel Development and Readiness Command; 22 January 1980, San Antonio, TX, Personnel Management for Executives Conference #59, U.S. Army Southwest Regional Training Center; 5 March 1980, Sheppard Air Force Base, TX, Management for Hospital Commanders Course, USAF School of Health Care Sciences; 2 May 1980, Maxwell Air Force Base, AL, Tailored Instructional Program, Air Command and Staff College; 4 June 1980, Colorado Springs, Personnel Management for Executives Conference #60, U.S. Army Southwest Regional Training Center; 4 September 1980, Austin, TX, Personnel Management for Executive Conference #61, U.S. Army Southwest Regional Training Center.

b. "On the Moral Justification of Military Obedience." (Presentation)

Presented at a panel on "Military Obedience and Discipline" at *The Citizen Soldier in Today's World*, a symposium conducted at St. Michael's College, Winooski, VT, 5-6 October 1979. A modified version is forthcoming in *Air University Review*. I briefly analyze the concepts of "autonomy," "authority," and "obedience" and use these analyses to evaluate the strength of various arguments suggesting a moral obligation to obey military authority.

c. "What is 'Professional Military Ethics'?" *USAF Academy Journal of Professional Military Ethics*, I, (April 1980) 1. (Article)

I pointed out that there are two sources of professional military ethics. One source is the set of values justifying

armed force in the first place. The second arises from the need to encourage those actions and attitudes necessary as a means to military effectiveness.

CHAPTER P
Department of Physics

1. ANDERSON, Wayne, Captain and Associate Professor

- a. "Characterization of Small Absorptions in Optical Coatings," *NBS Special Publication 568, Laser Induced Damage in Optical Materials*: 1979, p. 247. (Publication)

Probably the main causes of laser damage in thin films used as optical coatings are impurities, especially at interfaces. I considered the problem of identifying absorbing species, locating them in the optical structure, and measuring the amount of absorbing species present. The absorption caused by an impurity at a given location in the structure is directly proportional to the relative electric field squared at that location. This fact is used both to avoid absorption when it is not wanted and to enhance absorption when it is wanted, such as during analysis. My approach makes use of Poynting's theorem, viz., that the rate of conversion of electromagnetic to joule energy at any point in a medium is proportional to the square of the electric field at that point.

- b. "Impurity Detection in Laser Window Coatings," Laser Damage Conference in Boulder, Colorado, October 31, 1979. (Presentation)

I presented the optical spectra of several laser window coatings. The impurities that dominated these spectra were water, silicon, monoxide, and hydrocarbons. I presented my calculations that divulged the impurity concentrations and their locations in the coating.

2. DAVIS Richard W., Captain and Assistant Professor

- a. "Rare Gase Halide Lasers." Contribution to *High Energy Laser System Lightweight Engineering and Design* (HELSLED) Phase I Report (forthcoming AFWL TR). (Report)

The primary objective of this study is to generate weight and volume algorithms for near- and far-term laser systems of Air Force interest. My contribution discusses the state of the art and evaluates the feasibility of large-scale excimer lasers. I will generate weights and volumes in the phase II report.

3. MARTIN, Victor M., Captain and Instructor

- a. "Application of Infrared Thermography in the Analysis of Induced Surface Current Due to Incident Electromagnetic (EM) Radiation on Complex Shapes." Proceedings of the 1980 Society of Photo-Optical Instrumentation Engineers (SPIE) Symposium (Fall 1980). (Presentation)

This paper presents a quantified method for eliminating shape and surface emissivity dependence on complex shapes when observing their temperature profiles with thermography. I then apply the technique to the electromagnetic heating problem, as a result of electromagnetic wave absorption.

- b. "Determination of Electromagnetic Wave Absorption and Reflection Through Thermography." *The Infrared Observer*, No. 2/80. (Article)

This article provides a qualitative description of the research Captain Segal and I are conducting regarding electromagnetic wave absorption on complex shapes, such as aircraft.

c. "Experimental Determination of Electromagnetic Pulse (EMP) Absorption on Complex Shapes." 1980 Nuclear EMP Meeting (5-7 August 1980). (Presentation)

I co-authored this paper, which was presented by Captain Sega at the Anaheim, California meeting. He described the experiments we are doing to apply thermography in determining EMP absorption on complex shapes such as aircraft.

4. McCANN, Thomas E., Major and Associate Professor

a. "Computer Assisted Instruction (CAI) in Physics. (Research in Progress)

We are investigating the utility and potential usefulness of computers as instructional aides. Our assumption is that CAI can provide a very useful EI tool, a self-pacing instructional aide, and graphics or cartoon generators for the classroom. Other areas of CAI usefulness for physics purposes are not as yet well defined, but we can imagine approaching some forum of artificial intelligence.

Currently, we are "coming up to speed" on the Naval Academy donated CSIS Program. This program, now running on our VAX II system, provides a CAI author with file generation and editing capabilities which are not limited by inexperience with a computer. It allows the instructor to compose his CAI lessons as answers to straightforward questions answerable in plain English. This program will put CAI within the grasp of the entire Academy community.

b. "Interdisciplinary Energy Seminar Program." (Research in Progress)

The Basic Sciences Division will offer a senior-level seminar program in the Fall of 1980 to satisfy the integrated divisional honors seminar requirement of those students seeking the honors degree and to others who gain approval of a department head. Our seminar will deal with energy resources and their potential to solve our long-term fuel needs with environmental constraints.

We will conduct a seminar program on energy issues which the systems approach and operations research techniques will format. The structured approach will allow systematic comparisons of energy resources and allow us to make progress in understanding these complex issues.

We are currently working to identify seminar study resources and techniques to enhance the problem solving process.

c. "Research on Advanced Concepts in Laser Fusion" sponsored by Lawrence Livermore National Laboratory Livermore, California. (Research in Progress)

Computational studies on accelerating small particles to high velocities have continued. In particular, I have investigated the energy conversion processes, which are responsible for the conversion of kinetic energy to other forms of energy in the collision of a high velocity particle with an immovable object.

5. PUGH, Henry L., Captain and Associate Professor

a. "EPR Studies of Thermochemical and Photochemical Decomposition of Nitramines." 22nd Rocky Mountain Conference and 3rd International EPR Symposium (August 10-14, 1980). (Presentation)

Thermochemical and photochemical decomposition of propellants and explosives during transport and storage has long been a military problem. In this paper, I summarized my work on the important nitramine propellants, HMX and RDX. The electron paramagnetic resonance (EPR) studies I performed using the facilities of Frank J. Seiler Research Laboratory (FJSRL) indicated that radicals are formed in the photochemical decomposition of HMX and RDX and that these same radicals are produced in the thermal decomposition of these compounds. We are performing additional studies to determine the identity of the radicals and the mechanisms for their formation.

b. "Radicals Produced from Thermochemical and Photochemical Decomposition of Nitroaromatics." 179th American Chemical Society National Meeting (March 24-28, 1980) (forthcoming publication). (Presentation)

We described on-going research at FJSRL in the area of thermochemical and photochemical decomposition of militarily important nitroaromatic compounds, including TNT. We were able to identify radicals produced during TNT photochemical decomposition. These radicals were not the same as those observed in the thermochemical decomposition. For the photochemical process, we were able to identify a radical mechanism consistent with the observed radical species.

6. SEGA, Ronald M., Captain and Instructor

a. "Alpha Particle-Induced Soft Errors in Microelectronic Devices, Part One." *Military Electronics/Countermeasures* March 1980. (Publication)

This article provides a tutorial review and trend assessment of the recently discovered problem that alpha particles were capable of producing soft errors in VLSI dynamic memories. Beginning with an analysis of the design evolution of modern ICS, a review of alpha particle characteristics and their origin in IC packaging materials follows. Finally, I examine what happens when an alpha particle penetrates an IC.

b. "Alpha Particle-Induced Soft Errors, Part Two." *Military Electronics/Countermeasures*, April 1980. (Publication)

I extend the basic information laid out in Part One by describing secondary cosmic rays and their characteristics, and by highlighting possible effects of secondaries on VLS devices. Also explored are the possible implications which soft errors produced by trace radioactive contamination in IC packaging material, primary cosmic rays, and secondary or terrestrial, cosmic rays will likely have on future VLSI and VHSIC package, device and system design.

c. "Application of Infrared Thermography in the Analysis of Induced Surface Current due to Incident Electromagnetic (EM) Radiation on Complex Shapes." Proceeding of the 1980 Society of Photo-Optical Instrumentation Engineers (SPIE) Symposium (Fall 1980). (Presentation)

Capt M. Martin describes this and the following two works in his summary.

d. "Determination of Electromagnetic Wave Absorption and Reflection Through Thermography." *The Infrared Observer*, No. 2180 (June 1980). (Publication)

e. "Experimental Determination of Electromagnetic Pulse (EMP) Absorption on Complex Shapes." (Presented paper at NEM 1980 in Anaheim, California, August 1980.) (Presentation)

CHAPTER Q
Department of Political Science

1. ANDREWS, Adolphus, Lieutenant Colonel, Assistant Professor

- a. "Urban Redevelopment and the Structure of Power," Ph.D. Dissertation, Ohio State University. (Dissertation in progress)

The author examines the local politics associated with urban redevelopment. His research includes extensive interviews with local officials and other citizens of Columbus, Ohio.

2. BERRY, William E., Jr., Major, Instructor

- a. "Base Negotiations in the 1950s," *Bulletin of the American Historical Collection*, Manila, October-December 1980 issue. (Article)

Based on his doctoral research, the author examines the period of the Magsaysay Presidency and its impact on base negotiations.

- b. "The Effect of Military Base Negotiations on Philippine-American Relations, Ph.D." Dissertation in progress, Cornell University. (Dissertation)

The author presents an historical perspective on base negotiations from 1945 to the present with particular emphasis on the 1978-79 agreement and its implementation. He examines alternatives for the United States in the concluding chapters.

3. BUCKINGHAM, William A., Jr., Captain, Assistant Professor

- a. "Herbicide Use in Vietnam." (Article)

Prior to being assigned to the USAF Academy, the author worked in the Office of Air Force History where he began work on this manuscript. It is part of the official Air Force history on the Vietnam War. Work has continued on the project during his USAF Academy faculty tour.

4. BUTLER, Shannon R., Lieutenant Commander (USN), Instructor

- a. "East German Security Policies in the Third World," paper presented to a symposium, Institute on East Central Europe, Columbia University, May 1980. (Presentation)

- b. "East Germany in the Third World: Motivations and Security Implications," co-authored with Jiri Valenta, *Naval Institute Proceedings*, forthcoming 1981. (Article)

- c. "Eastern Europe's Presence in the Third World, co-authored with Jiri Valenta, Praeger Publishers, forthcoming 1981. (Book)

Based on research conducted in Bonn and Munich, the author examines the increasing military-security presence of East Germany in Africa and elsewhere in the Third World.

5. COOK, Curtis, Lieutenant Colonel, Tenure Professor and Acting Head

- a. "Civilian-Military Institute (CMI) Conference, Denver, 5 May 1980 on U.S. Foreign Policy and Its Defense Implications. (Discussant)
- b. "Making War," Symposium, Colorado College, 21 February 19870. (Participant)
- c. "Sondermann Symposium on the Presidency," Colorado College, 7-11 April 1980. (Participant)

6. DELLERMANN, Frank J., Major, Associate Professor

- a. "Comparison of Soviet and American Arms Control Negotiations," unpublished paper, February 1980. (Article)

The author contends that the arms control objectives of the United States and the Soviet Union are currently asymmetrical to the disadvantage of the United States. In order to negotiate with the Soviets on an equal footing, this asymmetry must be corrected.

- b. "The Role of Nationalism as an Obstacle to Change of the International System," to Air War College Seminar, August 1980. (Presentation)

Despite arguments made to the contrary, the international system is unlikely to change in its fundamental characteristics so long as nationalism remains a central element.

- c. "Soviet Continuities in Negotiations on Strategic Arms," (Article in progress)

The author's thesis is that Soviet objectives and negotiating positions have not changed significantly throughout the course of SALT.

- d. "Soviet Negotiating Techniques in Arms Control Negotiations with the United States," Ph.D. Dissertation, University of Southern California, September 1979. (Dissertation)

The authors argues that the USSR employs unique techniques in arms control negotiations. Accordingly, American negotiators must be prepared to deal effectively with these techniques.

7. DREW, Samuel N., Captain, Instructor

- a. "Yugoslavia: The Potential for Soviet Intervention During Transition to the Post-Tito Era," in *Cockpit Intelligence*, Spring 1980. (Article)

Captain Drew's article deals with political, economic, and military relations between the USSR and Yugoslavia. In particular, he argues that the factors for stability in Yugoslavia following Tito's death are strong enough to reduce the likelihood of any Soviet military intervention there.

8. DZIEDZIC, Michael J., Captain, Instructor

- a. "Latin American Issues," to the Graduate Studies Group, 22 April 1980. (Presentation)

Before departing for graduate school at the University of Texas, Austin, Captain Dziedzic made several presentations including "Cold War II" to the Forum Club (20 February 1980), "Latin American Issues," to the Graduate Studies Group (22 April 1980), "U.S. Relations with Latin America" to the Air War College Seminar (20 May 1980), and "Latin America: Yesterday, Today, and Tomorrow," to an Armed Forces Intelligence Training Center class (27 May 1980).

9. EWIG, Mark G., Captain, Assistant Professor

a. "Defense Policy in the Middle East: A Bibliographic Essay," prepared for the forthcoming edition of *Comparative Defense Policy*. (See listing under either Lt Col Murray or Maj Viotti.) (Article)

b. "Iran and Afghanistan." (Presentation)

Captain Ewig has also lectured on at least seven occasions on the events in *Iran and Afghanistan* to officer and cadet audiences as well as to the Retired Officers' Association (Pueblo), Rotary Club (Pueblo), Chamber of Commerce (Pueblo), and the Veterans of Foreign Wars (Pueblo).

10. FAST, Richard C., Major, Assistant Professor

a. "Roland and the Two Way Street: Politics and Policy of Arms Transfers," paper presented to the Annual Convention, International Studies Association, Los Angeles, March 1980. (Presentation)

In this paper the author notes that domestic political and economic considerations impede efforts to achieve standardization by NATO. The paper is to be published in an anthology by Pergamon Press. The author received the Second Annual Coble Award presented to a Political Science Department member for excellence in political science and national defense research.

11. FRENEY, Michael A., Lieutenant Colonel, Associate Professor

a. "West Germany Defense Policy." (Article)

The officer examines the international environment and defense decision-making in the Federal Republic of Germany with particular attention to national strategy and force employment doctrine.

12. FROEHLICH, Ralph A., Captain, Assistant Professor

a. "Prioritizing Intelligence Requirements." (Article)

The paper is a result of six weeks of research at the Defense Intelligence Agency in the summer of 1980. The author develops a scheme for establishing priorities associated with intelligence requirements and programs.

13. HAGENEY, Iris M., Captain, Assistant Professor

a. "The Presidential Nomination Process," two presentations to the Falcon High School Parents'

Association and Faculty, 4 April 1980. (Presentation)

14. HEYNS, Terry L., Major, Assistant Professor

a. "Defense Policy in West Germany: A Bibliographic Essay," prepared for the forthcoming edition of *Comparative Defense Policy*. (See listing under either Lt Col Murray or Maj Viotti.) (Article)

b. "The Soviet Union and the Olympics," National Military Intelligence Association, Denver, Colorado, 9 May 1980. (Presentation)

This lecture treats the U.S. response to the Soviet intervention in Afghanistan.

15. KLOTZ, Frank G., Captain, Instructor

a. "Britain's Strategic Nuclear Force and the American Connection: Implications for Arms Control Negotiations. (Monograph)

The monograph is the result of research completed in the summer of 1980 at the Los Alamos Scientific Laboratory and in Washington, D.C. The author investigates the British decision to replace its present strategic nuclear force with the American-made Trident I missile and the implications of that decision on American foreign and defense policy.

16. KOZAK, David C., Major, Associate Professor

a. "Analysis of 1980 Elections," faculty seminar, USAF Academy, with Professor Robert Loevy, Chairman of the Department of Political Science, Colorado College. (Presentation)

b. "Congress and Defense Decisionmaking," for *American Defense Policy*, 5th edition. (See separate listings for Capt Reichart or Capt Sturm, co-editors of that volume.) (Article in preparation)

c. "Congress, the Bureaucracy and Public Policy, Ripley and Franklin, *Western Political Quarterly*, Summer 1980. (Book Review)

d. "Decision Settings in Congress," paper presented to the Annual Convention of the *American Political Science Association*, August 1980. (Presentation)

The result of 380 interviews of members of the U.S House of Representatives between February and July 1977, the paper addresses how congressmen make up their minds in different ways, depending on the issue at hand. Congressmen may vote on ideological or philosophical grounds, in response to views of their constituencies, in a "cue-taking" mode as when they defer to certain members or staff members, or as part of a consensus on a given issue. Some votes may be "hot" or highly controversial; whereas, others may be routine or have low visibility. The degree of issue complexity is also a key variable. The author relates issue type to the grounds on which congressmen cast their votes. The paper in revised form will appear in the *American Political Science Review* in 1981 under the title "Variable Decision Rules in House Floor Voting." The author's Ph.D. dissertation at the University of Pittsburgh on the same subject will be published in 1982 by the University of Tennessee Press under the title *Contexts of Congressional Decision Behavior*.

e. "Invitation to Struggle: Presidential-Congressional, Crabb and Holt, *Journal of Politics*,

forthcoming 1980-1981. (Book Review)

f. "Multi-faceted Nature of Problems of Urban America," League of Women Voters, September 1980. (Presentation)

g. "On the Eve of the Primary Season," 4th Squadron Dining-In, February 1980. (Presentation)

h. "*Presidential Decision-making*, Alexander George, *Presidential Studies Quarterly*, Fall 1980. (Book Review)

i. "The Presidential Election of 1980: Implications for Defense Decision-making," Interdepartmental Colloquium, October 1980. (Presentation)

j. "*Presidential Influence in Congress*, George Edward, *American Political Science Review*, forthcoming 1980-1981. (Book Review)

k. "*Readings on Congress and Policy*, co-editor with Lt Col John Macartney, Dorsey Press, forthcoming 1981. (Anthology)

This anthology includes documentary and other resources not generally available to students of the U.S. Congress. It is to accompany a textbook *Congress and Policy* written by Charles O. Jones, Professor at the University of Pittsburgh and Managing Editor of the *American Political Science Review*.

l. "Sizing up the Campaign Election 1980," Sunday Adult Happening, Fairchild Hall, September 1980. (Presentation)

m. Sondermann Symposium on the Study of the Presidency, Colorado College, April 1980. Major Kozak introduced all of the films on the making of the President. (Co-Director)

n. "Studying City Council Role Behavior: Purposive Role Orientations of City Councilmen as an Indicator of their Views of the Federal System," to be published in *Legislative Studies Quarterly*, forthcoming 1981. (Article)

Based on work he began in 1968, the author argues that how city councilmen define their job affects their receptivity to increased federal aid to localities. If the job is self-defined as "policy-oriented," councilmen so oriented tend to favor increased federal aid to cities and tend to accept the associated federal regulations. By contrast, councilmen who see their role as "representative" of the people, tend to oppose such aid and see the associated federal regulations as an infringement on their prerogatives.

17. LATHAM, Richard J., Major, Instructor

a. "*China's Defense Policy and Domestic Politics*," (Presentation)

Before departing for graduate school at the University of Washington, Maj Latham prepared several papers on *China's defense policy and domestic politics*. Presentations were made to scholarly groups including the Asian Studies Association.

b. "The Cold War Revisited: The China Card" to the Forum Club. (Presentation)

c. "Contemporary China" to the Colorado ANG, Buckley Field, 23 May 1980. (Presentation)

d. "Defense Policy and China: A Bibliographic Essay," prepared for the forthcoming edition of *Comparative Defense Policy*. (See listing under either Lt Col Murray or Maj Viotti.) (Article)

e. "The Modernization of China," to the Rhodes Candidates. (Presentation)

f. "NORAD Briefings." (Translation)

Major Latham translated into Chinese several *NORAD briefings* that were then given to the PRC Military Delegation headed by Liu Hua-Ching, Vice-Chief of the PLA General Staff, 19 May 1980 and PRC Delegation headed by Geng Biao, PRC Vice-Premier, 31 May 1980.

18. MACARTNEY, John D., Lieutenant Colonel, Tenure Associate Professor and Deputy Head

a. "Civil-Military Institute (CMI) Conference," Denver, 5 May 1980. (Discussant)

b. "Congressional District Offices: Staffs and Functions," paper presented to the Annual Convention, American Political Science Association, August 1979. (Presentation)

Based on over 100 interviews, this paper details the activities and organizational arrangements of the offices that congressmen maintain in their home districts.

c. "The Professional Military Officer as a Political Actor." November 1979, the interdepartmental Defense Studies Colloquium. (Lecture)

d. "Readings on Congress and Policy, co-editor with Major David Kozak, forthcoming 1981. (Anthology)

This anthology includes documentary and other resources not generally available to students of the U.S. Congress. It is to accompany a textbook *Congress and Policy* written by Charles O. Jones, Professor at the University of Pittsburgh and Managing Editor of the *American Political Science Review*.

e. "Rhodes Candidates." (Lecture)

Lt Colonel McCartney presented a lecture to *Rhodes candidates* in November 1979.

19. MENARCHIK, E. Douglas, Major, Instructor

a. "Crisis Resolution, Decisionmaking, and Managing the Entebbe Raid, Ph.D. dissertation, The George Washington University. (Dissertation in progress)

The author is examining the decisionmaking structure that was involved in executing the Entebbe Raid.

b. "Strike Against Terror! The Entebbe Raid and the Role of Air Power in Counter-Terrorist Operations." (Article)

In this paper, the author examines lessons learned from the Entebbe Raid, citing Israeli Defense Minister Shimon Peres:

The cost of surrender always exceeds the cost of a military risk. The food of terrorism is success. The end of

terrorism is failure."

The author offers several prescriptions for American counter-terrorist operations.

c. "*Terrorism and Middle East Politics*." (Presentation)

Major Menarchik has made numerous presentations on *terrorism and Middle East politics*. Three lectures on "Transnational Terrorism" were delivered to faculty and staff in January and February 1980. Other lectures were delivered to the Canon City Women's Club (20 February), Colorado Dental Society (22 February), the Torch Club (21 May), the Middle East Studies Group (two presentations), the Arabic Club (two presentations); and the Security Police, OSI, Colorado Springs Police, and Colorado State Patrol (July 1980).

20. MURRAY, Douglas J., Lieutenant Colonel, Associate Professor

a. "*Comparative Defense Policy*" (Baltimore: Johns Hopkins University Press, forthcoming summer 1981). Co-editor with Major Paul R. Viotti. (Book)

The book uses a common framework designed by the editors for the comparative study of defense policy to include international environment; national objectives, strategy, and military force employment doctrine; defense decisionmaking actors and processes; and such recurring issues as civil-military relations, force posture, weapons acquisition, arms control, and the use of force. Countries examined include the United States, Soviet Union, China, France, West Germany, Britain, Japan, Romania, Sweden, and Israel.

b. "International Security Regimes: On the Applicability of a Concept," co-authored with Major Paul R. Viotti, paper presented to the Annual Convention, American Political Science Association, Washington, D.C., August 1980. (Presentation)

Most writing to date on international regimes (i.e., the sets of rules or norms in various issue areas by which states voluntarily govern or regulate their international relations) has been on socioeconomic, scientific, technological, and other non-security issues. The attempt in this paper is to extend the concept of *international regime* to cover the security dimension.

c. "*International Studies Association*," Philadelphia, March 1981. (Presentation)

Organizing Co-Chairman with Major Paul R. Viotti of 15 panels to be convened at the Annual Convention, *International Studies Association*, Section of Military Studies, Philadelphia, March 1981.

d. "Realism or Transnationalism? The Politics of North American Defense and International Monetary Relations," co-authored with Major Paul R. Viotti, paper presented to the Annual Convention, *International Studies Association*, Los Angeles, March 1980. (Presentation)

The paper compares state and non-state-centric images used in explaining international phenomena. Contrary to the conventional wisdom, the state as unitary actor seems more accurate in the economic case; whereas, the more fragmented transnational image is central to understanding the security case.

21. REICHART, John F., Captain, Associate Professor

a. "*American Defense Policy*," co-editor with Captain Steven R. Sturm. (Anthology)

This is the 5th edition, now in progress, of an edited anthology, publication by Johns Hopkins University Press is

expected by summer 1982.

- b. "Morality and Warfare," October 1979 church youth group. (Presentation)
- c. "Refugee Problems," November 1979 church youth group. (Presentation)

22. REYNOLDS, Charles W., FSO, State Department and Instructor

- a. "The Afghan and Iranian Situations and United States Interests in the Area," March and April 1980. (Presentation)

Mr. Reynolds addressed political science classes at Ft. Lewis College, the Durango Rotary Club, and a Durango radio station on this very timely topic.

- b. "The Historic Role of the United States in its Relations with Iran," at Colorado College, 12 May 1980. (Presentation)

The presentation was part of a five-day conference on the "New" Cold War.

23. ROSA, Frank L., Captain, Instructor

- a. "Terrorism: Past, Present, and Future," presented to Security Police, OSI, Colorado Springs Police, and Colorado State Patrol, July 1980. (Presentation)

Captain Rosa made this presentation with Maj Menarchik. Captain Rosa focused on American terrorist groups.

24. STEWART, Clay A., Captain, Instructor

- a. "SALT III and Turkey." (Research)

The officer examines questions associated with theater nuclear weapons and strategy on the southeastern flank of NATO.

25. STOEHRMANN, Kenneth C., Captain, Instructor

- a. "Perceptual Differences in Thinking the Unthinkable: World War III," a paper presented to an Air Force Intelligence-sponsored conference on the USSR on the subject of "The Soviet Union: What Lies Ahead?" September 1980. (Presentation)

Using a methodology designed by the author, he postulates that differential perceptions by the U.S., U.S.S.R., and the West European NATO countries result in different defense policies for deterring World War III (or fighting it, should war break out). [Over 350 persons attended the author's presentation.]

- b. "Specialized vs. Multi-Role Combat Aircraft: The Case of the F-111 in Western Europe," to the 4th Air Power Symposium, Air War College, March 1980. (Presentation)

Using the F-111 role in NATO as a case study, the author argues that multi-role combat aircraft will continue to be an

essential part of NATO defenses. More multi-(less specialized-) aircraft are needed if we are to be successful in any European theater war.

26. STURM, Steven R., Captain, Instructor

- a. "*American Defense Policy*," co-editor with Captain John F. Reichart. (Anthology)

This is the 5th edition, now in progress, of an edited anthology. Publication by Johns Hopkins University Press is expected by summer 1982.

- b. "Hackett's *Third World War*." (Presentation)

Captain Sturm presented a critical evaluation of General Sir John Hackett's *Third World War* to a meeting of the interdepartmental Colloquium on Defense Studies. He also participated in a special conference on Arms Control and Defense Planning, National Defense University, Washington, D.C.

27. VIOTTI, Paul R., Major, Tenure Associate Professor

- a. "The Carter Doctrine," Regis College, February 1980. (Presentation)

- b. "*Comparative Defense Policy*" (Baltimore: Johns Hopkins University Press, forthcoming summer 1981). Co-editor with Lieutenant Colonel Douglas J. Murray. (Book)

The book uses a common framework designed by the editors for the comparative study of defense policy to include international environment; national objectives, strategy, and military force employment doctrine; defense decisionmaking actors and processes; and such recurring issues as civil-military relations, force posture, weapons acquisition, arms control, and the use of force. Countries examined include the United States, Soviet Union, China, France, West Germany, Britain, Japan, Romania, Sweden, and Israel.

- c. "Comparative Defense Policy and International Security Regimes," Graduate School of International Studies, University of Denver, September 1980. (Presentation)

- d. "International Security Regimes: On the Applicability of a Concept," co-authored with Lt Col Douglas J. Murray, paper presented to the Annual Convention, American Political Science Association, Washington, D.C., August 1980. (Presentation)

Most writing to date on international regimes (i.e., the sets of rules or norms in various issue areas by which states voluntarily govern or regulate their international relations) has been on socioeconomic, scientific, technological, and other non-security issues. The attempt in this paper is to extend the concept of *international regime* to cover the security dimension.

- e. "*International Studies Association*." (Co-Chairman)

Organizing Co-Chairman with Lt Col Murray of 15 panels to be convened at the Annual Convention, *International Studies Association*, Section on Military Studies, Philadelphia, March 1981.

- f. "The Kurdish Rebellion in Iraq," article in O'Neill, Heaton, and Alberts (eds.), *Insurgency in the Modern World*, Westview Press, forthcoming. (Article)

Failure of the Iranian-backed Kurdish insurgency was due primarily to loss of external support, a critical variable essential to the success of the Kurdish national movement.

g. "The Military and Security in the Third World," Sheldon Simon, *Journal of Politics*, May 1980. (Book Review)

h. "Realism or Transnationalism? The Politics of North American Defense and International Monetary Relations," co-authored with Lt Col Douglas J. Murray, paper presented to the Annual Convention, International Studies Association, Los Angeles, March 1980. (Presentation)

The paper compares state and non-state-centric images used in explaining international phenomena. Contrary to the conventional wisdom, the state as unitary actor seems more accurate in the economic case whereas the more fragmented transnational image is central to understanding the security case.

i. "SALT II: An Overview," *Checkpoints* (quarterly magazine of the Association of Graduates), Winter 1979-1980. (Article)

The author reviews arguments on the various sides of this controversial issue.

28. YOUNG, Robert M., Captain (USA), Instructor

a. "The Peacekeeping Role of the United Nations in the Middle East." (Presentation)

Captain Young has made a number of presentations to faculty and student groups on the peacekeeping role of the United Nations in the Middle East. The presentations have been based on Captain Young's experiences from 1976-1978 when he served as aid-de-campe to Lt General Ensio Siilasvuo, Chief Coordinator of UN Forces, Middle East and as Operations Officers, UNIFIL in Lebanon.

b. "The Soviet Middle Range Officer." (Article)

This paper is based on one year of direct contact with officers of the Soviet Navy, Air Force, and Army.

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