



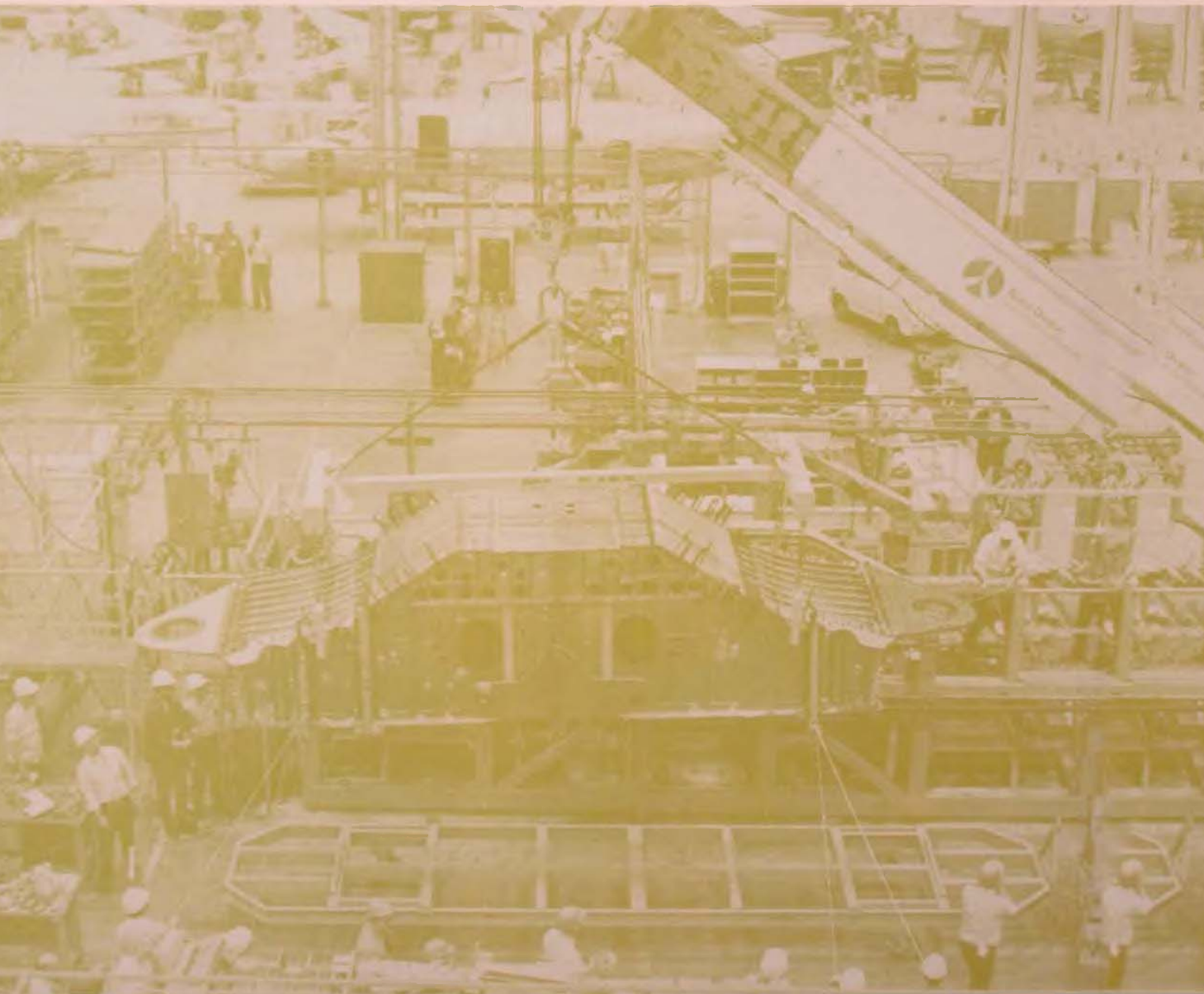
AIR UNIVERSITY **review**

MAY-JUNE 1976





The Professional Journal of the United States Air Force





from the editor's aerie

Lieutenant General John W. Pauly's "Thread of Doctrine" constitutes what we believe to be a solid platform for continuing dialogue on Air Force doctrine. As an offspring of the twentieth century and its technological revolution, the Air Force has faced a formidable challenge in developing doctrine and tactics to keep pace with the quantum leaps in hardware capability. We mean for *Air University Review* to contribute to this process by providing a forum where conflicting ideas may help refine and sharpen evolving doctrine.

Our cover graphically reflects General Pauly's "... yesterday's lessons learned, applied to tomorrow's expectations."

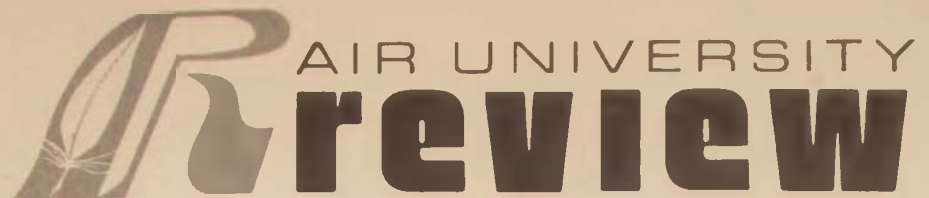
In an article both profound and whimsical, Hoyt W. Huggins speculates on the present and future role of computers in the conduct of human affairs. Anyone concerned with the impact of computers in the management process will find that Huggins offers some stimulating—even offbeat—insights.

Among letters that cross the Editor's desk from time to time are those inquiring if the *Review* would be interested in book reviews or articles from sources outside the Air Force. The answer is an emphatic yes. Although the majority of our contributors have traditionally been active duty or retired Air Force personnel, we have always welcomed articles from anyone who has something significant to say. Aspiring authors need not feel that their opinions must conform to what they perceive to be the official policy of the Air Force. We welcome differing points of view so long as they are well supported.

Potential book reviewers interested in receiving a book for review should drop us a card or letter indicating their area of competence. Despite the fact that we have regular reliable reviewers, we always welcome new talent and fresh points of view.

Since our authors often express pleasant surprise when they receive a check for their articles, perhaps it is worth mentioning again that we do offer modest sums for articles accepted for publication. The only exception applies to Air Force or other federal personnel whose articles were written during normal duty hours.

At the end of February the *Review* lost one of its most capable and dedicated staff members and the Air Force an employee of long-standing tenure. Miss Genie Cory, Copy Editor for the *Review* since the *Quarterly Review* days back in 1957, started her federal employment in 1927, the year in which Charles Lindbergh flew the *Spirit of St. Louis* solo across the Atlantic. Her 48 years and four months' continuous federal service establishes a record in Air University not likely to be broken. Miss Cory's painstaking care to detail and her wealth of Air Force experience will be greatly missed, but we delight in her accepting a retirement so richly deserved. *Ave atque vale.*

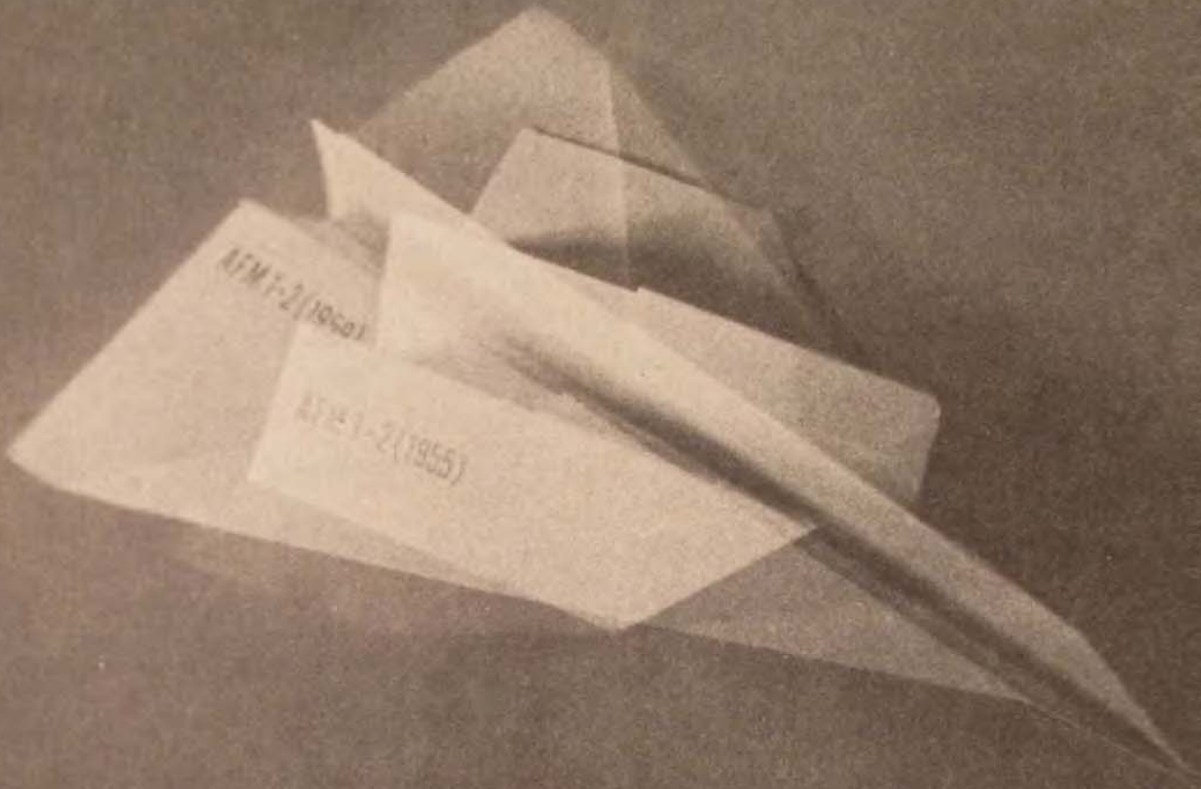


AIR UNIVERSITY
review

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ATTENTION

The *Air University Review* is the professional journal of the United States Air Force and serves as an open forum for exploratory discussion. Its purpose is to present innovative thinking and stimulate dialogue concerning Air Force doctrine, strategy, tactics, and related national defense matters. The *Review* should not be construed as representing policies of the Department of Defense, the Air Force, or Air University. Rather, the contents reflect the authors' ideas and do not necessarily bear official sanction. Thoughtful and informed contributions are always welcomed.



THE THREAD OF DOCTRINE

LIEUTENANT GENERAL JOHN W. PAULY

doctrine—Fundamental principles by which the military forces or elements thereof guide their actions in support of national objectives. It is authoritative but requires judgment in application.

JCS Pub. 1, Department of
Defense Dictionary of Military
and Associated Terms

Aerospace doctrine is an authoritative statement of principles for the employment of United States Air Force resources. It is based on an accumulation of knowledge gained through military experience, study and test. It is designed for continuing applicability in war and peace.

AFM 1-1, United States Air
Force Basic Doctrine

THE essence of doctrine lies in its purpose: to teach, to endow a body of people with a common set of broad assumptions, ideas, values, and attitudes as a guide to future actions. Rather than a one-time revelation from on high to be taken as dogma, doctrine is the product of a continuing effort to join theory and practice—one of the most difficult of all enterprises. Theory, without the leavening of experience, lacks substance and foundation; experience without theory lacks an adequate frame of reference to accommodate future changes that will surely come. Meaningful Air Force doctrine, suitable for all the complexities and forms of modern aerospace warfare, is the synthesis of theory *and* experience.

In this context, the human equation plays a fundamental role. For example,

the act of one man hitting another man was the genesis of man's combat experience from which military doctrine evolved, albeit in its most rudimentary form. Today's doctrine is the product of combat experience in the form of yesterday's lessons learned, applied to tomorrow's expectations. Doctrine, therefore, is the discipline that is applied to bring about a reasoned adjustment to the dynamics of modern aerospace warfare and promote the rational employment of modern aerospace forces. Warfare has winners and losers. More often than not, winners have successfully applied certain time-proven principles in the employment of their forces. Such principles and their application are the substance of the *discipline* of doctrine. We can reasonably conclude, then, that in the future, as in the past, our success or failure in war will rest to a large degree on our doctrine and how we apply it.

This article will trace the evolution of doctrine, more specifically basic doctrine, as it applies to the United States Air Force, and in doing so will answer the questions: (1) How did it come to be this way? and (2) Was it through logic and careful analysis of experience? (3) What has been the influence of the Air Force-wide coordination process? and (4) What ideas have prevailed? In reviewing the history of basic military doctrine for answers to these questions, we are led to the conclusion that the ultimate product is a carefully and thoughtfully derived statement of well-established and proven employment principles, which also reflects adjustments to changing national security policy and

strategy. Tracking these principles in Air Force basic doctrine, we will find that there is a consistency or "thread" of doctrine that has stood the test of combat, the evolution of Air Force thinking, and the dynamic aspects of doctrine development.

Let's begin by tracing the evolution of basic doctrine from its roots in the minds of our early Air Force leaders. As we proceed through time, the doctrinal thread that persists, and is slowly but steadily refined, is the idea that air power is an entity and as such can best be employed under the principles of centralized control and decentralized execution. While the early manifestation of this idea was in the concepts of strategic bombardment, it has come to be applied to all aspects of aerospace operations.

Many officers of our earlier Air Service, Air Corps, and Army Air Forces contributed to the development of such concepts, which have been elevated to the level of Air Force doctrine. Earliest and best-known of American air power advocates was General Billy Mitchell, whose flamboyant personality and flair for publicity gained wide recognition of his ideas about air power, particularly those of an independent air arm and the primacy of strategic bombardment. Generals "Hap" Arnold, Hugh J. Knerr, and Haywood S. Hansell, Jr., among others, were disciples of Mitchell and helped put many of his ideas into practice. Eventually, theory and practice evolved into Air Force doctrine.

The basic documents produced during this period that reflected the evolution of these early ideas include:

War Department Training Regulation No. 440-15, "Fundamental Principles for Employment of the Air Service" (1926)
Air Corps Tactical School, "Employment of Combined Air Force" (1926)

War Department Training Regulation No. 440-15, "Employment of the Air Forces of the Army" (1935)

WDFM 1-5, "Employment of the Aviation of the Army" (1940)

AWPD-1, "Munitions Requirements of the Army Air Forces" (1941)

FM 31-35, "Aviation in Support of Ground Forces" (1942)

WDFM 100-20, "Command and Employment of Air Power" (1943).

Most of these documents were narrowly circumscribed statements about the employment of aviation. They considered air support of the ground forces to be the main mission of Army aviation. The exceptions were the Air Corps Tactical School publication, "Employment of Combined Air Force" (1926), AWPD-1 "Munitions Requirements of the Army Air Forces" (1941), and WDFM 100-20 "Command and Employment of Air Power" (1943).

The first "envisioned the air arm being coordinated with land and sea forces, having as its aim the destruction of the enemy's morale and will to resist, preferably by means of attack against the targets in the enemy's interior."

AWPD-1, prepared in 1941 and incorporated as part of a joint Army-Navy study of overall U.S. production requirements for defeat of the Axis, has been called "a notable achievement which marked both the apex of pre-war doctrinal thought and a blueprint for the air war which would follow."¹

FM 100-20, published on 21 July 1943, grew directly out of the experience of the then recently concluded North African Campaign. The lesson of North Africa lay in the fragmentation of air power and the consequent inability to concentrate air power; this was the result of organizational arrangements that had the effect of making air support organic to Army divisions.

FM 100-20, reflecting the lessons learned, declared that land power and air power were coequal, that gaining air superiority was the first requirement for success in land operations. More important, it rejected the principle of organic control of tactical air assets by stating that control of available air power must be centralized to realize the maximum benefits. This represented a complete turnaround in official Army doctrine and helped pave the way for an independent Air Force. It was a landmark document, expressing the principle of centralized control of air power in joint operations.

The basic concepts, beliefs, principles, and attitudes that emerged in the years between World War I and World War II provided the foundation for the broad statement of air power doctrine found in FM 100-20 and subsequent USAF doctrinal publications. Air as a separate operating medium, an independent Air Force, emphasis on the offensive, strategic bombardment, centralized control of air power, and control of the air—all represented the essence of Air Force doctrine. These essentially consistent and interrelated ideas were driven chiefly by the strong and persistent belief of most Air Corps officers in an independent Air Force and in strategic bombardment. The doctrine of the 1920s and 1930s—that the bomber was the dominant air weapon—supported the concept of strategic bombardment, the most independent of all air missions, and therefore was the primary justification for an independent Air Force. The insistence on centralized control of air power grew out of theories that were formulated during World War I but remained only a hope until 1935, when the General Headquarters Air Force (GHQAF) was organized. The preparation of AWPD-1 in 1941 was next in a crescendo of events leading to the acceptance of air power doctrine. In 1943,

with the issuance of FM 100-20, the Army formally accepted the principle of centralized control of air assets. By the end of World War II the Army Air Forces had gained acceptance of most of its doctrinal precepts, with the notable exception of independence. That came shortly thereafter.

In the years immediately after World War II, the Army Air Forces was too busy demobilizing and reorganizing to pay much attention to doctrine. Not until after the passage of the National Security Act of 1947 did the newly born United States Air Force direct attention to its doctrine. In September 1947, the month in which the independent Air Force emerged, Headquarters USAF, realizing the void in current air power doctrine, directed the new educational center, Air University, to revise the 1943 version of FM 100-20 and recommend a system of doctrinal publications. Five and one-half years later, on 1 April 1953, the first USAF basic doctrine manual, AFM 1-2, was published.

The sources of inspiration for this initial statement of Air Force basic doctrine were, of course, all of the documents and ideas previously mentioned, plus the experience of World War II and some postwar additives. The Air Force declaration of independence, the National Security Act of 1947, did not spell out missions and functions, except in the most general terms. It did charge the Air Force, by law, to develop the basic tenets regarding the use of air power. The President's Air Policy Commission, headed by Thomas K. Finletter, placed overriding emphasis on an air strategy of retaliatory attack against an enemy's industrial capacity. The Key West and Newport Agreements, both in 1948, represented early official statements of roles, missions, and functions of the three services. Those agreements set to rest notions that all aviation, including

Navy and Marine, would be included in a single Air Force. The functions of the services were spelled out, providing boundaries for the subsequent formulation of doctrine. These agreements eventually were incorporated into DOD Directive 5100.1 and JCS Publication 2, *Unified Action Armed Forces (UNAAF)*, which clearly spell out the functional responsibilities for the services.

The purpose of AFM 1-2 was to "provide and impart to all Air Force personnel a basis for understanding the use of air forces in peace and in war, and to serve as a background for succeeding manuals covering the tactics and techniques for employing air forces."²

The purpose of the U.S. military instrument was to *deter* aggression or to *repel* it if it occurred. Air forces were purported to be most decisive in actions dealing immediately and directly with the enemy's warmaking capacity, a reflection of the consistent thread of thought on strategic operations since the early years. The manual emphasized the uncommon versatility of air forces and related them positively to the principles of war. It distinguished two broad and interdependent aspects of air operations: heartland and peripheral actions. Control of the air was emphasized as necessary for both of these categories, and unity of effort was also stressed. While offensive operations were considered to be the best way to provide security for the homeland against attack, an effective air defense was also considered mandatory. In general, AFM 1-2 was a clear reflection of contemporary Air Force ideas and attitudes at that time; it retained the concept that air power was an entity and that offensive strategic operations and centralized control of air operations were fundamental precepts in the employment of air power.

The Air University played a central role

in the development of USAF doctrine during this period. At the direction of Headquarters USAF, it functioned as a doctrinal center, at first unofficially and then officially, beginning in 1951. In addition to the 1953 version of AFM 1-2, Air University developed and submitted for publication during 1953 and subsequent years a series of operational manuals designated 1-3 through 1-11. These had to do with theater air operations, air defense operations, strategic air operations, and the like.

The first revision of AFM 1-2, published in April 1954, differed very little from the 1953 version. Although the 1953 edition had been subjected to review throughout the Air Force, only minor editorial changes were made in 1954. The edition of the manual published in April 1955 was, however, a major revision. Nevertheless, as in previous manuals, it continued to stress the principle that air forces are an entity and their employment must be under the centralized control of an air commander at a level high enough to exploit their characteristics fully. The new manual also stressed the capabilities of air power throughout the entire spectrum of international conflict, taking cognizance of the capabilities of air power in periods other than general war. It defined air power as including the entire aviation capacity of the United States. Control of the air was the desired position; "control is achieved when an air force can effect planned degrees of destruction while denying this opportunity to the enemy."³ The manual advocated minimizing the striking capacity of enemy air forces as a primary consideration in war. It considered air defense forces in-being as indispensable to national security, and it set forth the view that air forces have the capability to conduct wartime operations against all components of an enemy's strength. This briefest of the basic doctrine manuals

had only 4100 words, setting a worthy standard for those that have followed.

Sputnik, missiles, and space were reflected in the 1959 revision of AFM 1-2. This revision incorporated the concept of aerospace as "an operationally indivisible medium consisting of the total expanse beyond the earth's surface."⁴ Moreover, the manual declared that the operating systems of the Air Force—air systems, ballistic missiles, and space vehicle systems—were the "fundamental aerospace forces of the nation."⁵ It stressed the importance of maintaining a position of general supremacy in aerospace in both peace and war. Such supremacy could affect the fundamental elements of a nation's strength.

The years between 1959 and 1964 witnessed great changes in the strategic environment and the thinking about that environment. The advent of the submarine-launched ballistic missile and the acquisition of a major strategic nuclear offensive capability by the Navy, the development of missile and satellite technology and deployment of missiles and satellites on a large scale, the adoption of a flexible response and the search for multiple response options by the Department of Defense, the Berlin crisis of 1961 and the Cuban missile crisis of 1962—all impacted significantly on the scope and context of the Air Force basic doctrine manual. The emergence of "flexible response" as our national security policy brought a new surge of initiatives, notably by the Army, to develop organic airlift, reconnaissance, and close air support capabilities, which competed with Air Force missions. Thus, roles and missions and doctrine-related matters became national issues, with their focus not only in the Department of Defense but in the Congress as well. During this period also, when matters related to doctrine were becoming national issues, responsibility for preparation and publica-

tion of USAF Basic Doctrine was transferred from Air University to the Air Staff in Washington. A Doctrine Division was established in the Directorate of Plans to assume the responsibility. Later, the division became a part of the Directorate of Doctrine, Concepts, and Objectives under the Deputy Chief of Staff for Plans and Operations. The Doctrine Division retains the responsibility, today, for the development, formulation, and implementation of USAF Basic Doctrine.

In August 1964 the changes in the strategic environment and concepts for employment of forces in that environment culminated in publication of AFM 1-1 as the replacement for AFM 1-2. This edition was also strongly influenced by Project FORECAST, a major Air Force study in 1963-64 headed by General Bernard A. Schriever, which sought, among other things, to identify the goals of national policy that would influence systems development decisions and other decisions within the Air Force.⁶ The new AFM 1-1 set forth general characteristics and requirements of aerospace forces and described the various modes of employment of these forces at different levels of warfare. This manual also acknowledged that thermonuclear weapons and an assured delivery capability in the hands of potential enemies had created a new strategic environment and profoundly affected the use of military power. The basic conclusion held that

... the nature of modern war has altered the use of force to the extent that total victory in some situations would be an unreasonable goal. Where enemies with capabilities to destroy our urban centers are involved, we should seek military objectives more realistic than total defeat of the enemy.⁷

But despite the dynamics of the period, there remained the enduring doctrine that

air power is an entity best employed under centralized control at levels high enough to fully exploit its inherent characteristics and capabilities. And, while the 1964 manual retained a strong emphasis on offensive strategic operations, it also identified and discussed each of the tactical air missions in conditions of nuclear, conventional, and counterinsurgency operations.

It should be noted that the nuclear test-ban agreement between the United States and the Soviet Union had been signed in 1963. The preliminary discussions that came eventually, in the years after 1964, led to the strategic arms limitation agreement of 1972. The trend toward parity in strategic nuclear offensive forces became increasingly apparent after 1964 and had impact on later versions of AFM 1-1.

Although a revision of the 1964 manual did not appear for seven years, work on it began almost immediately after publication of the 1964 version. There was a full-scale draft revision in 1965 and a series of additional drafts at least annually thereafter.

A new AFM 1-1 was approved by the Chief of Staff and published in September 1971. This manual took into account the prevailing thought in the Defense Department. It affirmed that the "national leadership must be provided with a wide range of alternatives in the use of military power"⁸ and stated the characteristics, tasks, and capabilities of aerospace forces for performing a wide variety of functions. The manual reaffirmed that the "primary objective of U.S. national security is deterrence of military actions which are counter to U.S. interests."⁹ This had been the basic concept underlying U.S. national security policy since World War II. Moreover, the manual used the term "force sufficiency" and found that it included all

of the elements required to achieve the basic objectives of the Air Force. It differed, therefore, very little from previous statements of broad requirements to perform USAF missions. It did, however, reflect terminology derived from the Defense Reports of the new Secretary of Defense, Melvin R. Laird. Finally, the manual discarded the terms "general war" and "limited war" in favor of four categories of operations that were considered more descriptive and adequate: conventional operations, low-intensity nuclear operations, high-intensity nuclear operations, and special operations.

Again, work was started immediately on the next revision. After three years of relatively continuous work and broad staffing throughout the Air Force, a new manual was approved by the Chief of Staff in November 1974.

As with previous versions, it is possible to perceive a basic and continuing thread of broad principles that have their roots in the historical evolution of airmen's thinking over the past fifty years. The words have changed, and new excursions into areas reflective of 1973-74 national policy pronouncements are immediately evident. As a result of today's challenges of war, national environment, and international relationships, many generalized concepts and policies have been included in the manual. However, fundamental principles learned from two World Wars, reinforced in subsequent armed conflicts, as well as from analyses, tests, and hypotheses, are enduring.

In essence, the changes in the manual reflect the dynamic evolvement of our national security policy and strategy, while at the same time reinforcing the specifics of the enduring fundamental employment principles of aerospace power addressed in basic doctrine.

The process by which AFM 1-1 is pro-

duced seems to bear out the maxim that the means are as important as the ends. It is unlikely that anyone reads the manual more carefully or analyzes it more thoroughly than the authors and the critics of drafts of the manual. Among the critics are literally hundreds who are experts on some aspect of doctrine. Thus, hundreds of USAF officers, including generals, engage in an extensive dialogue that examines Air Force basic thinking in depth. This debate illuminates the various facets of Air Force doctrinal issues. Out of this dialogue and debate, issues are identified, doubts resolved, and the enduring concepts of air power employment emerge in their doctrinal vestments.

WE assert that Air Force basic doctrine is alive and well. History shows that our doctrine has been responsive to changing times and philosophies while maintaining a consistent thread of fundamental principles. We can conclude that our doctrinal process is a discipline—a discipline for dealing with new concepts, technology, and roles and missions relationships with other services or allies. It serves to sharpen the debate by providing a framework of time-proven principles against which we can illuminate and test contending ideas now and in the future. However, in the final analysis, the most important function of doctrine is that it provides the fundamental guidance for the employment of aerospace forces in combat.

In the experience of three major wars—World War II, Korea, Southeast Asia—we have seen a consistent thread of basic doctrine encompassed in the most fundamental of principles: that air power is an entity and is best employed under the centralized control of a single authority who is at a level that can best orches-

trate the total air effort. This has been the basis for Air Force positions on issues involving command arrangements in the employment of air power throughout our combat experience. The most recent example was the issue over single manager for air in South Vietnam that gained sharp focus during the battle for Khe Sanh. The question was whether Marine Corps tactical air would operate independent of, or under the operational control of, the Deputy for Air Operations to COMUSMACV. After considerable debate, which at times reached all the way to the office of the Secretary of Defense, command arrangements that provided for a single manager for air were established. The need for such arrangements lay in the essence of centralized control: enabling a commander to exploit fully the characteristics and capabilities of air power and the flexibility to shift and mass firepower or forces in a single integrated effort, wherever and whenever needed. The late Army Chief of Staff, General Creighton W. Abrams, appreciated and understood this philosophy as well as anyone. In testifying before the House Armed Services Committee, he said:

Close air support, as provided by the Air Force for somebody in the position I was, the overall commander (COMUSMACV), there is no way to replace that with helicopters . . . it can generate . . . more hitting power . . . because high performance aircraft can carry a much greater payload. And you can focus that very quickly. I don't mean from the first brigade to the second brigade. I am talking about . . . instead of putting it in [Military Region] MR-4, you go to MR-1; you switch that whole faucet and you do it in about 45 minutes. The whole control system and base system that supports that, there is nothing in the Army like that. There is nothing anywhere in the world like it.¹⁰

As was noted earlier, our basic doctrine is subject to constant and critical review.

Numerous drafts are analyzed throughout the Air Force before AFM 1-1 is promulgated. However, the number of people who work directly on it is small when compared to the total USAF population; time and circumstances preclude a formal review by every Air Force member before the document is published. It therefore becomes an individual effort for our men and women to learn about Air Force doctrine. It is essential that each member take it upon himself to be familiar with the manual and understand these fundamentals of our very existence.

Armed with the knowledge gained through reading and comprehending AFM

1-1, we should be able to speak out confidently and discuss our primary missions and how we go about accomplishing them. As with any organization, the professionalism of our Air Force depends in large measure on how well we know our missions and the basic doctrine that guides us in performing them.

Air Force Manual 1-1, *USAF Basic Doctrine*, can be the source of much of this information, and it's as close as the nearest publications file. The motivation for getting it out and reading it is your own individual professionalism.

Hq United States Air Force

Notes

1. Robert Frank Futrell, *Ideas, Concepts, Doctrine: A History of Basic Thinking in the United States Air Force 1907-1964*, Second Printing, Air University, 1974, p. 59.
2. AFM 1-2, *United States Air Force Basic Doctrine*, Washington, D.C., 1 April 1953, p. i.
3. AFM 1-2, *United States Air Force Basic Doctrine*, 1 April 1955, p. 8.
4. AFM 1-2, *United States Air Force Basic Doctrine*, 1 December 1959, p. 11.

5. *Ibid.*
6. General Schriever reviewed Project FORECAST in an article entitled "Forecast" published in *Air University Review*, March-April 1965, pp. 2-12.
7. AFM 1-1, *United States Air Force Basic Doctrine*, 14 August 1964, p. 7-1.
8. AFM 1-1, *United States Air Force Basic Doctrine*, 28 September 1971, p. 1-1.
9. *Ibid.*, p. 1-2.
10. Creighton W. Abrams, *Testimony before House Armed Services Subcommittee*, "Close Air Support," Washington, D.C., 17 April 1973.

Any critic can establish a wonderful batting average by just rejecting every new idea.

J. D. WILLIAMS

THE Department of Defense faces a monumental task in the area of training and education. Between 15 and 20 percent of its 3 million military and civilian personnel are normally involved in the training process, either as trainers or trainees.

As the military budget has decreased, weapon systems have become more complex. To research, develop, acquire, maintain, and operate these systems require that more resources be devoted to producing qualified personnel. The answer is increased efficiency in the training and educational process. (For this discussion, the distinction between training and education will be unexpressed, and the teaching means used in both, by adoption from various technologies, will be referred to as "instructional technology.")

The Department of Defense keeps training and education under constant review, and additional innovative and cost-effective measures should result from the FY 76 funding of \$32.4 million for research and development of instructional technology.



INSTRUCTIONAL TECHNOLOGY IN THE DEPARTMENT OF DEFENSE

now and in the future

DR. M. RICHARD ROSE

One indicated change is the relocation of training from the large central training centers to field, ship, and submarine locations for almost continuous upgrading of a highly specialized nature for smaller numbers of individuals, so as to maintain the required high state of readiness in the complicated weaponry employed by today's armed forces.

Secondary, but still important, is the general education provided to members on active duty and former members under the GI Bill. The combination of educational and training opportunities is the cornerstone of the all-volunteer force in attracting high-quality men and women.

More than 85 percent of all service-learned skills have a direct and immediate civilian application. Department of Labor studies indicate that one out of every six civilian craftsmen acquired his or her skill in the military.

In a broad sense, then, the \$7 billion annually expended by the Department of Defense in education and training can be viewed as a national social investment. The challenge is to find more efficient ways for continuing and improving this investment in our nation's most valuable resource, manpower.

Technology in the Instructional Process

In the recent past, instructional technology has seemed to reach a temporary plateau. This is not to say that significant developments have not emerged. They have. The experience of high hopes for educational tv and computers, accompanied by significant investment in the private sector and the subsequent failure of these media to effect the expected revolutionization of educational processes, has induced an air of caution

as to future heavy investment in the private sector. The present plateau, however, can only be viewed as a launching pad for what must inevitably follow. Unprecedented forces are at work in the form of aggregating and synergistic technological advances, accompanied by the continued knowledge explosion and attendant knowledge obsolescence cycle—all of this overlaid with the reality of increasing paucity of resources. It is well to examine briefly the present state of the individual technological ingredients as a prelude to a look beyond the present horizon.

instructional approaches

Instructional approaches within the Department of Defense (DOD) are undergoing significant changes in response to the new fiscal environment. An example is the Instructional System Development concept pioneered by the Air Force and subsequently pursued by the other services. The system involves the development of behavioral criteria that state what the student will be able to do as a result of instruction; develop criterion tests that indicate whether the student achieves the objectives; plan, develop, and validate instruction; and, finally, conduct and evaluate the training. By keying the training to specific job requirements, both overtraining and undertraining are avoided. The second aspect of such an approach is to make courses self-pacing, using such strategies as individualized instruction modular scheduling and a wide variety of audiovisual/computer-linked techniques.

Advanced Instructional System

The Air Training Command is moving rapidly toward a totally integrated system utilizing the most advanced instructional

technologies under the "umbrella" of the Advanced Instructional System (AIS). The primary ingredients of such a system included preliminary analyses of human factors, facilities, reliability, and system maintainability. Long-range plans envision the possible centralizing of the existing five major Technical Training Centers, with the potential for creation of a network not unlike the ARPANET, wherein many major universities and industrial complexes are linked together for the purpose of sharing information.

Central to the planning of an advanced system is the essentiality of increased responsiveness to validated requirements. Components include the Time-Share, Interactive, Computer-Controlled Information Television (TICCIT) and the Lincoln Terminal System as well as PLATO IV, all of which will be discussed. The planners and programmers of the system contemplate increased pooling of training items at a central or regional site offering the greatest potential for forward efficiencies. Automated and self-paced technologies are envisioned, possibly even allowing the trainee freedom of action in selection of the best delivery system for the individual's needs. Possible technologies could also include voice-sensitive terminals, three-dimensional manipulative visual displays, touch-sensitive terminals, and keyboard devices integrated into master computer systems of combined training and training management.

The planners also contemplate the future potential for virtual memory units using magnetic bubbles that could permit a smaller mainframe than is currently possible but one possessing significantly more capacity. Use of virtual capacity, due to the dynamic buffer zones, would significantly improve communication relays, either by telephone lines or microwave lengths.

The forward potential of multiplexing at a single, central site or through geographic regions opens even wider vistas for efficient sharing of training technologies and capacities, either intra- or inter-service.

learner-centered instructional research

A widely held contemporary educational philosophy views the student as a relatively passive individual. Curricular materials are organized and delivered in such a way as to make learning possible. This whole philosophy and approach is being re-examined by the Advanced Research Projects Agency (ARPA). In an admittedly high-risk but high-gain area, the ARPA study postulates that alternative technological approaches to learning are possible, centered in learning strategies. The thrust would be directed toward making people smarter, rather than contents smarter, using such devices as methods of improving memory and reasoning ability. Having done this, it is postulated that in subsequent courses of instruction the trainees could utilize the newly learned skills in improving their own learning. An analogous concept is found in present undertakings in which computer science techniques are utilized to make machines smarter in the whole area of artificial intelligence.

instructional television

Within the Department of Defense, there continues to be a recognized role for educational television. This medium is used in each of the service academies, in the Naval Postgraduate School, the Air Force Institute of Technology, the professional military educational schools such as the command and staff colleges and war colleges, and in the service training commands. The

Air Force finds educational television especially valuable at Air University in the Academic Instructor course. In training all Air Force instructors, including those who will assume duties as professors of aerospace science at colleges and universities throughout the country, this institution offers a 20-hour elective course in educational television. In addition, television is used extensively in critiquing platform presentations (self-confrontation).

At other military teaching institutions, educational television is used to bring field experiences into the classroom. In naval operations as well as flying operations, television introduces a valuable cost-effective dimension by permitting students to view an environment without the high cost of equipment operation.

An exception to the declining use of instructional television throughout the Department of Defense is found in the Academy of Health Sciences of the United States Army located at Fort Sam Houston, Texas. This organization has a vital outreach program in the medical and health sciences field, including an extensive loan library of videotape cassettes. Included are programs designed primarily for continuing education of professional medical personnel, in addition to lesson plans for training and instruction in paramedical fields. The library of video cassettes exceeds 1000 different programs. In addition, the Academy operates a 12-channel closed-circuit playback system in support of the Academy of Health Sciences' academic curriculum, medical teaching programs of the medical center, and patient rehabilitation and educational programs. A wide range of both studio and mobile production equipment is utilized in conjunction with modern, up-to-date techniques and procedures. Given some of the technological advances in communications, to be discussed later, there is obvious potential for expanded ap-

plication and transmission of educational material through satellite or other advanced means.

In general, however, each of the services is moving to consolidate and otherwise reduce costs attendant to television operations. A primary reason is a general disenchantment with black-and-white television, coupled with the high cost of color television. In the Air Force the number of television production centers in use has been reduced from six to one. The other services have similarly reorganized, with single centers servicing much wider geographical areas. The price paid is lack of immediate responsiveness.

It was previously noted that 20 to 30 percent of the approximately 900,000 hours of "on-call" Department of Defense instruction obsolesces annually. The relative costs of developing and updating such material are revealing:

Development and Updating of Instructional Material

(Cost per student minute—after having developed learning objectives)

	<i>Develop</i>	<i>Update</i>
Sound-on-slide	\$ 13	\$ 2
Computer-assisted instruction	\$ 38	\$ 2
Color television	\$248	\$200

The relative developmental and update costs suggest a central reason for the present de-emphasis of educational television as a primary instructional medium.

Another reason for the present decrease in the use of educational television is its inherent lack of flexibility in some modes and high cost in others. In the case of videotape, there is no potential for feedback or question-and-answer session. Video disk technology, as presently being developed by Philips, RCA, and Thompson CSF, addresses to a large degree the problems of flexibility and offers great promise. The disk permits random access, as well as branching and switching to other modes,

such as computers, for mediation. The drawback lies in the cost of producing the video disks. While it is estimated that video disk viewing equipment may soon be available for \$500 each, significant investment is essential for the equipment required for production. Production runs of approximately 2000 disks are required to bring costs within the reach of most users. In view of the unfortunate marketplace experiences of those who lost after making significant investments in educational technology in the past, heavy investment will not be soon forthcoming without a proven market.

Militating against extensive use of video disks in DOD training establishments is the low intensity of requirements in terms of numbers of disks required and the wide variety of courses needing constant updating. Scalar economies would not be reached in the majority of DOD requirements, which range from runs of two to two hundred items. There is, however, a great potential for such technology in Defense overseas schools, educational programs, and other high-intensity instructional applications.

cable television

An aspect of cable television as a communications mode of particular interest to policy-makers, planners, and educators is its low cost. In one investigation conducted by the MITRE Corporation, the cost of cable to bring mediated instruction into a series of homes in one community was less than \$2000.

miniature computers/microprocessors

Continuing breakthroughs in micro technology present tremendous potential for computer miniaturization at very low cost. Five years ago computer time cost

\$20 per student hour. Presently computer time in many cases can be obtained for less than \$1 an hour. There is a real possibility that, in the intermediate term, miniature computers or microprocessors can be sold for less than \$100 each.

holography

This recently emerged technology of combined reflected light waves and laser optics permits the introduction of highly realistic imagery in three dimensions unmatched by any other photographic method. This whole area of laser technology appears to be on the threshold of making truly major contributions to educational technology.

The hologram produced by laser technology is totally descriptive of the medium. It comes from the Greek roots "holos" and "gram," meaning *message*, and those who have viewed such holograms would agree that in fact the medium does truly convey the *whole* message.

Far from being a simple three-dimensional image, the holographic projection is visually indeterminable from the real object. The image preserves all of the visual information about an object, including spatial depth. The unique contribution of laser light in the process, in addition to encoding and transmitting the information, is that it stores all of the information in the hologram in a totally unique way, permitting retrieval. Laser light directed on the hologram unlocks the stored visual information, permitting the viewer to see the original object reconstructed in space in full dimensionality.

The applications to instructional technology are legion. It has been said that we think in holograms. What, then, could be a better medium for conveying information than one consistent and in tune with perceptual and cognitive patterns!

The awe inspired by one's first view of Michelangelo's "Pieta" could be shared by all. Similarly, brain surgeons around the world could simultaneously study a master surgeon's art in unprecedented proximity. At leisure, with full dimensionality, individuals located in a submerged submarine could be instructed in the intricacies of a complex piece of equipment that defies description in plano. The compatibility of holography with video cassette and video disk technology opens vistas that defy description.

The potential of holography for raising training effectiveness while realizing large economies is suggested in a 1972 study that estimated the value of operational equipment used for training to be in excess of \$4.5 billion. With nuclear propulsion systems and jet aircraft, as well as a wide variety of other equipment costing millions of dollars each, a large part of these costs could be avoided. Up-to-date and extensive holographic libraries of the pertinent high-cost equipment could be maintained, for example, at training sites around the world on video disk for immediate call-up and study as required. Trainees could become intimately familiar with the equipment, lacking only the hands-on phase, which could be easily attained on the job.

Holography will certainly have a profound impact on instructional methodology, perhaps on our world and our lives.

rapid transmission and storage system (RTS)

A unique system pioneered by Goldmark Communications Corporation is especially pertinent in view of present fiscal constraints as well as increasing update training needs. By use of a unique process that is pedagogically as well as psychologically sound, pictures and graphic material are

produced and overlaid with sound as the main medium.

In addition to being highly successful as a teaching/learning device, the system, known as Mark I, has the additional advantages of low production cost coupled with low update cost—a significant item. A variety of sound tracks to the same video presentation makes the system multilingual. The outstanding feature is the transmission and storage capacity. A standard one-hour, one-inch videotape will contain 30 times the capacity of existing systems, or the equivalent of 30 one-hour programs. From within any of the groups of 30 segments, any number of programs can be reproduced simultaneously on different television sets. An individual user would have access to all programs on the tape, with the capability of selecting, stopping, and repeating at will.

The RTS programs can be transmitted over standard television station cables, microwave, or satellites. The high-density storage capability of the system is paralleled by extremely high transmission efficiency by compression of data at a 15-to-1 ratio. During a hypothetical eight-hour period, when a television station or satellite might normally be off the air, approximately 240 different half-hour lessons could be transmitted, received, and stored. This system, with its high efficiency not only in rapid transmission and low-bulk storage but in low cost of updating, should find widespread application in the Department of Defense as one of the primary components of alternative instructional delivery systems in the future.

satellite communications

The roundness of the world introduces certain constraints on the typical line-of-sight communications systems. Whereas the "High Antenna" project conducted by Pur-

due University, using an airplane as a broadcasting station, was able to broadcast television programs to hundreds of Midwest schools, a satellite independent of atmospheric interference and weather phenomena offers unparalleled opportunity for maximum coverage.

Such a potential was demonstrated in May 1965 when a high school class in West Bend, Wisconsin, and a class at the Lycée Henri IV of Paris, France, linked up via Early Bird satellite for a joint one-hour class. Since that time numerous experimental and prototype programs have been conducted. Under the present leadership of the National Institute of Education, the goal of a national educational network is fast approaching realization.

Applications Technological Satellite ATS-6 experiments initiated in 1971, jointly by the Department of Health, Education and Welfare and the National Aeronautics and Space Administration, pioneered the widespread applicability of satellite communications as an instructional and informational medium. The premise underlying the experiment of direct and immediate application to the Department of Defense was "that satellites could provide information to people who cannot easily, quickly, or economically be reached by other means and that, given its capability to reach large geographic areas, a satellite could convey special information needed by comparatively small, isolated groups."

A series of interrelated experiments involved separate activities occurring in Appalachia, the Rocky Mountain region, and Alaska and were referred to by the National Institute of Education as the "Education Satellite Communications Demonstration." The demonstration constituted the largest and most complex application of technology to education ever attempted.

By use of available time on the ATS-6,

multiple-voice signals as well as color television were transmitted to small, inexpensive antenna-receivers from its geosynchronous orbit above the equator. From this position, television beams on the ATS-6 transmitted signals to provide double footprints approximately 1000 miles north to south and 300 miles east to west on the Rocky Mountain and Appalachian sites.

In addition to "receive-only" terminals, which cost approximately \$4000 each, "intensive terminals" were utilized; these latter had the ability to receive both audio and video signals and to transmit audio signals, permitting interactive participation. Programs transmitted included the "Time-Out" series on career education, directed toward junior high school students and including information on decision-making, self-assessment, and career education. Additional series include "Careers in the Classroom," for in-service training of teachers and staff members at the junior high school level, and "Footprints," designed for adults in rural, isolated communities. Such topics as health care, land use and environment, problems of the aging, and consumer education were included.

The National Institute of Education experiments appeared to have preliminarily answered the question regarding the effectiveness of satellites as alternative delivery methods of education to rural and highly isolated populations. This pioneering work has led the way to presently emerging consortiums for the expanded use of satellite communications.

The international aspect of satellite communication, aside from the Alaskan experiment, was demonstrated by the same ATS-6 satellite. In August of 1975 India began the Satellite Instructional Television Experiment. For one year the Indian Space Research Organization (ISRO) will use the NASA satellite to beam tv direct into 2400

isolated villages. Clearly demonstrated will be the ability of satellites to operate on call to all parts of the globe, delivering a wide variety of informational and instructional programs utilizing various technologies.

It remains for the Department of Defense to realize the full potential of this satellite technology, which is so immediately and directly applicable to a defense organization dispersed in nearly 100 countries, on more than 600 ships and operating locations throughout the world. Toward this end, research is presently being contracted by the Advanced Research Projects Agency that will study the feasibility of using this technology in shipboard training.

computer-assisted instruction

A report prepared by the MITRE Corporation, dated 1972, contains the blunt assertion that computer-assisted instruction (CAI) has been a commercial failure. After tracing and properly identifying the root causes of the commercial failure, the National Science Foundation funded MITRE to "catalyze the mass dissemination of CAI"—this goal to be realized through the achievement of a major market success for computer-assisted instruction. Time-Share, Interactive, Computer-Controlled Information Television (TICCIT) is presently being used in two demonstration systems at the community college level with great success.

Despite the commercial failure of computer-assisted instruction, which was largely due to environmental factors and marketing problems rather than the inability of the system to do the job, computer-assisted instruction has found a broad constituency in the Department of Defense. All four services are finding extensive applications for the system, which has been proven to

reduce training time by as much as 35 percent and failure rates frequently in excess of 20 percent.

Examples of on-line advanced technology systems include PLATO IV, currently being used throughout the country in technical training. It consists of a keyboard, a high-speed individual image selector, a random-access audio device, and a plasma display panel with variable numbers of terminals. Computer support is supplied by the University of Illinois and is possibly the most advanced computer-assisted instruction system using a large central main frame. Presently the system will accommodate 700 students on-line at any one time.

The Navy uses PLATO IV (Programmed Logic for Automatic Teaching Operations) in at least three advanced developments, including role-playing techniques. One program is directed toward understanding and improving interpersonal behavior in basic training between recruit and trainer. The second program involves a study concerning the value systems and attitudes of company commanders. A parallel undertaking is in the form of developing criteria for predicting successful performance in the role of recruit company commander.

A three-year effort using PLATO IV has just been completed at Aberdeen Proving Ground, Maryland. The evaluation results indicated that, in general, students who receive their instruction through CAI perform significantly better than students who receive their instruction in other ways. In addition, both student and instructor attitudes were positive. Time-savings ranging from 15 to 45 percent were consistently realized, compared to traditional group-paced instruction. However, the costs of computer-assisted instruction in this particular form in the near term may be too high to provide a viable instructional system for the Department of Defense. Ex-

panded potential applications and the continued escalation of personnel costs continue to interact. In the intermediate term, scalar economies *may* be reached, and cost/benefit analyses suggest the feasibility of implementation.

The Lincoln Terminal System, developed by the Lincoln Laboratories of Massachusetts Institute of Technology, employs a terminal with a viewing screen and audio speaker. With a keyboard for student responses, terminals are connected to a central minicomputer, programmed to monitor student progress and facilitate branching. The random-access audio fiche feature replaces the computer memory. The system has proven highly cost effective in reducing training times and associated personnel costs, in some cases by as much as 37 percent. A follow-on version is programmed for remote sites and field training detachments not requiring the minicomputer hookup.

computer-managed instruction

In computer-managed instruction, the computer may not play a direct instructional role as it does in computer-assisted instruction; rather, it manages the instructional process, i.e., the testing, diagnosis, and prescription. Students may receive all their instructional materials in some sort of off-line mode, usually programmed instruction text, audiovisual materials, or any other instructional method. The computer, in this mode, also manages instructors and deals with the resource allocation problem. Potentials for combination are apparent.

The Navy has made significant use of this computer management. In one study, documented savings—through the reduction of training time and attendant personnel costs—possibly exceeded \$10 million in one year. In addition, the number

of instructors needed to teach this course was reduced by 20 percent. Student performance rates were slightly better than under the old system. Both student and instructor attitudes were positive toward computer-managed instruction.

As a result of these studies, the Navy has bought the computer hardware and software to implement an expanded program. Currently 2000 students per week are employing the system. Within the next five years it is estimated that 15,000 students will utilize the system weekly. In order to provide the curriculum materials for this level of effort, the Department of the Navy is allocating between 2 and 3 million dollars for the next three years to replace group-paced materials with self-paced instruments utilizing advanced instructional technology.

simulation

The whole field of simulation, including synthetic flight training systems, has received unprecedented interest. Recent advances in high-fidelity simulation and 360-degree visual systems promise greatly to transform flight training as well as the specialized training associated with all high energy-consumption equipment.

The reasons for such an increasing role are obvious. It has been variously estimated that, while the cost of a simulator could be ten times that of an aircraft, it is possible that the annual training hours generated by a simulator could exceed those of an aircraft by ten to one. Other studies project a potential reduction of up to 50 percent of present flying time in undergraduate flight training through increased use of flight simulation. It is further estimated by some that up to 25 percent of all flying might be replaced by simulation.

There remain as many questions as answers in the field of mechanical and

flight simulation in such areas as the proper mix of actual versus simulator training, certain interactive effects with other sensory modalities, and a variety of similar complex relationships. As the answers to these vexing questions emerge, simulation will play an increasingly key and central role in the instructional equation.

wired garrison concept

Recognizing the continued sophistication of communications electronics systems on Army posts and the piecemeal, sometimes incompatible, nature of the various systems, the United States Army joined with MITRE Corporation in examining the concept of a wired garrison. The present complex of separately designed, procured, installed, operated, and maintained systems tends toward increased cost and decreased efficiency. In the light of recent technological advances in the field of communications and computers, it was postulated that interrelation of existing systems could result in an integrated multimode information transfer system with greatly increased capacity as well as efficiency, perhaps at lower cost.

Implicit in the planning for this undertaking were the vast needs in the field of training and education within the Army. The Department of the Army has clearly stated realistic educational and training goals for each member, which are spelled out in a master plan. The *Army Educational Services Plan* is soundly based on the principles that each Army member should be permitted the opportunity to develop his maximum career potential, that the process of learning is continuous and life-long, and that educational opportunities both attract highly qualified, highly motivated people and retain them for a more productive average period of service. This, coupled with the technical training require-

ments engendered by continued and accelerating knowledge obsolescence, creates a prevailing requirement for educational and training delivery systems.

In addition to proposed mission-related training programs, the educational components of the wired garrison concept are intended to extend from basic literacy instruction through the postgraduate level. The MITRE Corporation, upon completion of a "need assessment" coupled with an inventory of available systems and technologies, proposed an action program at Fort Bliss, Texas, to meet the validated needs. Included are a wide variety of computer-assisted, self-paced combinations, including two-way interactive video systems. Also being examined is an array of programs using computers for simulations and gaming purposes in logistical as well as complex technical and administrative fields. Remote access is a primary consideration in all applications. Using low-cost cable tv with currently available hardware, it would be possible to bring to the post hundreds of individual courses offered through The Association for Graduate Education and Research. A consortium of seven private educational institutions, located in north Texas, pools their physical and academic resources to enhance graduate education in the Dallas-Fort Worth region. A wide variety of other courses is available, either off-the-shelf or from other adjacent institutions of higher learning. This imaginative joint undertaking by the Department of the Army and MITRE represents a model and potential to be carefully examined by others, both in the Department of Defense and elsewhere. The implications and ramifications of such a system are legion.

Beyond the Horizon

The Department of Defense is probably the largest instructional institution in the

world, with a span of courses ranging from prekindergarten to the most sophisticated postdoctoral studies and including a full range of specialized training. At any given time, more than one-half million individuals are participating in the DoD training and educational process. Given these realities, it was to be expected that the Department of Defense would assume a lead role in the advancement of instructional technology toward increasing efficiency and reducing costs. This has truly been the case.

Recognizing the potential for redundancy when each of the services has requirements to train individuals, frequently in the same skills, the Army, Navy, Marine Corps, and Air Force joined together in creating the Inter-Service Training Review Organization. This organization, headed by the training chiefs of each of the four services and working through a structure of committees with representatives from each service, has been in operation since September 1972. The purpose of the organization was not to create a new super training agency, with attendant bureaucratic inertia, but rather within present resources to organize a small group of experts and users to examine existing training processes, practices, technologies, and needs and thus to realize any economies possible through cooperation, consolidation, exchanges, or changed training patterns and practices.

From an early start in 1972, 27 enlisted occupational specialty subgroups, seemingly indicating the greatest potential for consolidation, were examined, and ten of these subgroups later consolidated. The organization has continued its efforts with great success. Aggregate recurring savings now exceed \$2,850,000 in cost reductions, and annual cost avoidance is in excess of \$1,200,000 as a result of actions to date.

One committee within the organization

—the Training Technology Committee—is committed to the increased coordination and exchange of all facets of instructional technology. The committee's charter states:

To review existing and new training technology with the objective of utilizing advancements by all Services, thereby effecting significant cost savings and avoiding unnecessary duplications.

A present initiative of the organization's subpanel on technology is a study contract, funded by the Advanced Research Projects Agency's Training Resource Application Information Data Exchange, under the acronym TRAIDEX. This feasibility study envisions a system that would enable all members of the training community to input to a central bank or repository the various software and hardware elements of training technology and support material required in the development of training courses. The system would be designed to interface with all existing systems, making research and development advances of one group, agency, or service immediately available to all.

Simultaneously, a program is being undertaken to create mutual interservice support areas, geographically bounded, within which there will be a totally free technology exchange between participants. Ten such mutual support areas have been designated, and interchange is already taking place. These initiatives are all designed toward forward effectiveness and avoidance of reinventing the wheel.

In looking beyond the horizon (admittedly a dangerous pursuit), this Inter-Service Training Review Organization will increasingly play a central role in fulfilling the needs created by continued escalation of training costs, quantum technological advances, and the requirement for greater

sharing of existing resources toward realizing even greater efficiencies.

instructional systems—thrust of the future

On re-examining the constituent parts of present-day instructional technology, one can readily see that the prior analogy to instructional technology now being poised on a launching pad is probably valid. With the combinations of computer-assisted instruction and computer-managed instruction in the context of advanced holography, video disk, and videotape and minicomputer technologies, the instructional process of the future will change dramatically. Further, communications media advances, in terms of cable television and satellite communications to carry such programs, combined with the Goldmark Rapid Transmission and Storage System, suggest potentials almost defying description. The general nature might well be that of flexible, multipurpose, integrated instructional systems.

The possibility of an interservice-shared satellite communications system with presently redundant time devoted to instructional transmission immediately comes to mind. With such a system, military members located at the most far-flung and isolated posts, including submarines and ships at sea, using stand-alone learning carels including video disk/tape and minicomputers, could be constantly updated in their fields of specialty. In addition, high-quality educational courses ranging the full spectrum, from remedial through graduate study, would be available for off- or on-duty education.

In the future, instructional technology will increasingly play a role early in weapon systems acquisition processes. Cost-benefit analyses of training subsystems to support such weapons will become an implicit part of the acquisition and de-

ployment decision process, in light of the significant impact of instructional demands on the total cost of a weapon system during its life cycle.

Similarly, a significant number of research and development managers within the Department of Defense feel that computer-managed instruction in one form or another will have a predominant role during the next five years. Further utilization of this technology will place in the hands of decision-makers the appropriate information on the optimal mix of technologies to be used in any instructional process, recognizing the individuality of the learning process and the continuing need to reduce time in training and to get individuals on the job faster and better trained.

It is apparent that all of the technological components for advanced instructional systems of unprecedented efficiency and economy are at hand. The pitfalls, however, lie in the attitudes and minds of men. Such technology should be embraced and adopted only within the context of learner-centered systems, not for technology's sake alone. Those senior officers charged with the educational and training responsibilities for members of the Army, Navy, Marine Corps, and Air Force have shown unparalleled vision in what has taken place to date. It remains only for the same individuals, personally and through the aegis of the Inter-Service Training Review Organization and its working committees, to continue to fit together the continually emerging complex existing pieces of the jigsaw puzzles, toward the ideal.

Mr. David Sarnoff's prediction made in 1966 has been more than fulfilled:

. . . some of the most profound changes wrought by the computer will be in education, . . . the task ahead will be to assign to the machine those things which it can best do and reserve for man those things he must provide and control, . . .

Unparalleled opportunities lie ahead to improve the quality of man's life while increasing the efficiency of the instructional process. Away from the stultifying effect of group-paced learning, the individual, sharpened in abilities to learn, motivated by the instructional process itself, will be free to proceed at an individually selected pace in a mode best fitted to his or her learning pattern and abilities.

The men and women who serve in our armed forces are and must continue to be the best the nation has to offer. The demands placed upon them by ever advancing technology and decreased resources can be met only through such alternate instructional delivery systems. At the same

time, these men and women must continue to be afforded those opportunities for educational advancement enjoyed by their peers not serving in the armed forces. Components of instructional technology, in hand or soon to be available, offer an unprecedented opportunity for the creation of a true "learning society" in the Department of Defense.

Alfred University

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THE EDITOR

Perhaps the most valuable result of all education is the ability to make yourself do the thing you have to do, when it ought to be done, whether you like it or not. This is the first lesson to be learned.

THOMAS HENRY HUXLEY

DO computers facilitate, or do they control? How would you answer if you thought the computers were coming to life? Ponder the madness of computer intelligence in control of our vast network of communications, logistics, and weapon systems. Science fiction nonsense? But surely history is replete with science fiction "told-you-so's." Moreover, there have been hundreds of *non-fiction* works published over the past 20 years which seriously *declare* that computer consciousness is not only possible but likely.

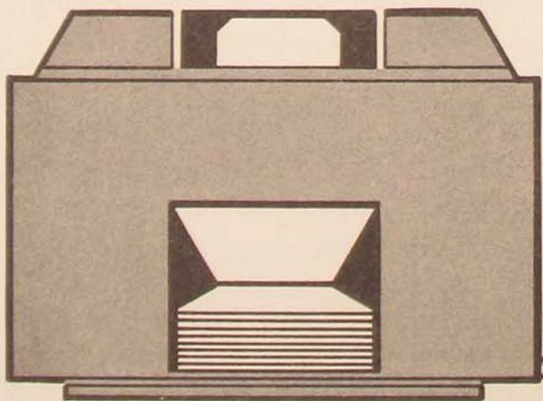
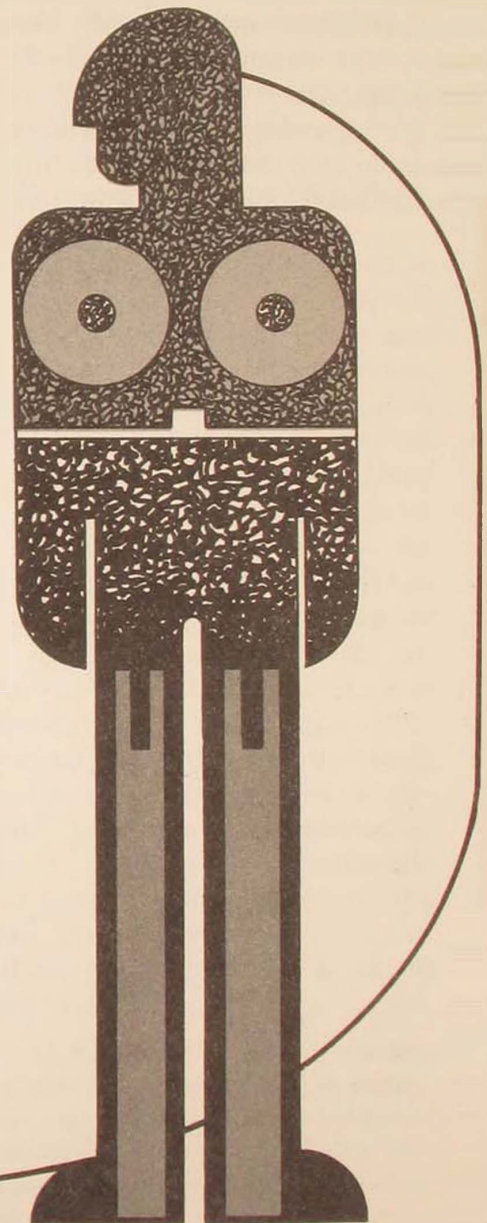
With the possible exceptions of IBM and AT&T, the U.S. Air Force stands out like no other organization in its image of vast modern technology packed full of computers. Surely we should be the last to be unclear on this matter of machine intelligence—even for a discussion over a Friday beer at the club.

In hopes the reader will finish with at least a more comfortable answer to the first question, let us apply a cool but decidedly unmechanical approach to the issue.

ONE of the oldest computer jokes around tells of the latest IBM creation

COMPUTERS ALIVE ?

HOYT W. HUGGINS



being fed the entire works of Saint Thomas Aquinas and then being asked, "Is there a God?" After a few tense seconds, a print-out appears with the words, "There is now."

Despite its antiquity, this story serves well to keynote the eerie feelings that grip some of us as we learn of the amazing capabilities of today's computers. Moreover, the apprehension goes back further than the joke.

In the last century, English author Samuel Butler wrote "The Destruction of the Machines of Erewhon," foreshadowing serious consideration of machine life by many later experts. For most of us, this kind of speculation vaguely agitates our common sense, but few of us do more than shrug it off, and some of us believe it might actually be possible. As with many other subjects, we have become victims of our dependence on the "explanations" of the experts instead of masters of our own analyzing abilities.

This time, let's respond to our common sense, consult known scientific knowledge, examine the data, and get at the truth. We can begin by reviewing Butler's forebodings.

Butler feared that man would continue to evolve machines of increasing propensity for becoming living species. In fact, he wondered if they were already conscious, patiently plotting their evolutionary perfection and eventual domination of the world. If not, he was sure that one day man would produce a mutant having consciousness and independence. Moreover, he implied that the machine's consciousness would spring into being—like Pallas Athena, fully panoplied—with a value system underpinned by self-survival. You see, Butler's machines would just naturally view man as both enemy and servant: a threat to survival, yet essential to it. The machines would therefore ruthlessly conquer and mercilessly control mankind, that is, un-

less the hapless victims acted quickly to destroy all machines.

Butler quite obviously did not understand the concept *consciousness*. Just as obviously, he did not understand the conceptualization process required for extending the primitive survival instinct to the abstraction *threat*. Let us deal first with the latter.

"The machines would . . . ruthlessly conquer and mercilessly control mankind . . . unless the hapless victims acted quickly to destroy all machines."

To do this, let us imagine that, somehow, a machine has developed consciousness. Does this mean that it automatically has a tendency to survive? If it does not have this "value," it would certainly be indifferent to its own continued existence. It therefore could not regard anything as a threat. The term "threat" can have no meaning to an entity that does not value its own life. In fact, the behavior of such a conscious machine would be indistinguishable from a nonconscious machine. Without a survival or *life* value, no other value is possible. With no values, the machine would go on behaving according to the laws of physics, no more. So, we must conclude that, for the machine to be dangerous, it must awaken with a survival value.

Where does it get this value?

An updated Butler, though free of his Victorian assumptions, might still argue that a survival value is *inherent* in consciousness. If so, he must necessarily produce his proof from our knowledge of

biology. He should not mind, therefore, if I too turn to that field. He might even be happy to let the argument stand or fall on my analysis, which purports to show that, by correcting some false notions traceable to the field of biology, the idea of machine consciousness becomes nonsense. If I am successful in presenting that analysis, the question of whether machine consciousness would include a survival value becomes moot.

“ . . . for the machine to be dangerous, it must awaken with a survival value.”

On the other hand, if my intrepid opponent would bring the machine to life outside the laws of biology, that is, by an undiscovered process which contradicts those laws, he must compound the fiction by giving it a survival value from the same thin air from which he gave it consciousness. Keep in mind that we are dealing with reality, laws of nature, laws which have been discovered, not invented.

Finally, if the insistent mystic argues for miraculous machine consciousness *without* a survival value, he will have circled back to the here and now. He, like some modern scholars, would be indulging in the game of describing our current, nonconscious electronic automatons with undeserved and illogical definitions.

Aided by twisted concepts of biology, some experts blithely continue to resurrect the notion that somehow the complexity of construction in a computer, together with its memory and learning abilities, will produce synapsis and bring a living being into existence. What does science say about consciousness? What are the errors the experts make that permit serious con-

sideration of computer consciousness?

In the first place, most writers on computer development make the mistake of using the term “memory” as a primary, with a definition equally applicable to both computer and man. The justification is seldom explicit, but the implicit “logic” is that both man and computer exhibit some of the same memory characteristics (input, storage, retrieval); therefore, they both possess a memory. Several writers have described the differences in human and computer memories as merely differences in speed and size.

John G. Kemeny, President of Dartmouth College, in his book *Man and the Computer*, points out that man’s memory is slow but has an enormous capacity, while the computer’s is fast but has a relatively limited storage volume. Together, argues Dr. Kemeny, they can exponentially compensate for each other’s deficiencies and move mountains. He argues for symbiosis, after explaining that he already regards the computer as a species. He implies that, if a computer has a memory, it must be conscious, even if at a level not yet recognized by man. He is right, of course. *If* a computer truly has a memory, it is indeed conscious. But Dr. Kemeny gives no hint that he understands the reason for the correctness of that position. Where he is wrong is in thinking the computer has a memory.

“Memory” for a computer is a component of materials in a separate, uniquely locatable *place* with assigned functions. Man’s memory is a *mental process* subsumed under the concept consciousness, has no specific location, and performs intricacies far beyond the assigned retrieval functions of the computer “memory.” Observe Dr. Kemeny pondering the human “retrieval” system:

. . . we are remarkably efficient at retrieving items from our memory. We seem to be able to do it through mysterious processes of as-

sociation that no one has duplicated on the computer. How does one associate a phrase in a book with a conversation held ten years ago? How does one associate a smell with a childhood memory? How, in trying to solve a problem, do we pull out three unrelated memories going back to different periods in our life to come up with a new approach to the solution? And how do we sift through hopelessly large amounts of information presented to us daily by our senses and retain just the most relevant facts?¹

The phrase "retrieving items from memory" is perfectly appropriate for describing the action of a computer but is grossly misleading when applied to man or to any other living, conscious entity. Man does not activate a probe to scan a storage unit located under the cortex in a corner of the hypothalamus. He does not use positive and negative charges in binary or octal code to match location core address to call address. (A process, incidentally, which is *independent* of address content!) He does not then send the content forward to a display or process register. This is the computer procedure for retrieving an item from "memory." Computers *retrieve*, man *remembers*, two immensely different processes.

What notions helped obliterate the distinction? Part of the problem is the naïve awe with which some observers regard the astonishing *speed* of the computer, as if this alone endows the machine with intelligence and therefore with life, or at least the name "memory" for its retrieval system. But the main culprit comes in a package of false biological ideas, which seem to have influenced Dr. Kemeny and others who write on computers. These ideas spring from the "theory of reduction," which rests on the premise that all the phenomena of life can be accounted for, described by, and deduced from the laws of physics and chemistry; thus, by "reduc-

tion," an inanimate object has consciousness. That theory has been thoroughly refuted by Robert Efron, M.D., Chief, Neurophysiology-Biophysics Research Unit, Veterans Administration Hospital, Boston, Massachusetts, in his paper "Biology without Consciousness—and Its Consequences," presented at the Center for Philosophy of Science, University of Pittsburgh, on February 27, 1967.²

Dr. Efron explains that learning and remembering are two related mental processes performed by the conscious mind of a living entity. Just as walking is a physical process performed by a living entity and cannot occur independent of an entity, neither can learning or remembering occur as primary and independent phenomena. The reductionists, however, gave new and unsupported meanings to the terms "learning" and "memory," disconnecting them from consciousness. By what convoluted reasoning have the reductionists foisted these impossibilities onto the field of biology? The answer will help us see how these ideas landed unchallenged in the field of computers.

"Computers *retrieve*, man *remembers*, two immensely different processes."

Dr. Efron shows that the reductionists use the epistemological method of definition switching, which consists of

arbitrarily defining the contradictions away. The reductionist attacks the definition and usage of every word which has historically referred to an action of a living entity: "memory," "reflex," "free will," "cognition," etc. He then redefines that same word so that it will be applicable to an action of an inanimate entity.³

In the process, the reductionist uses the "stolen concept" fallacy,⁴ whereby a concept is used while ignoring, contradicting, or denying the validity of the concept on which it logically and genetically depends. For example, the concept *orphan* cannot exist without the antecedent concept *parent*. Similarly, the internal contradiction in the assertion "There are no absolutes" is often overlooked even though that very assertion is an absolute and depends on the existence of the concept *absolute* to have meaning and is therefore, by *ipsissima verba*, false. Electron is subsumed under (not a component of) mass and charge; as an electron has mass and electrical charge, we cannot deny the concepts *mass* and *charge* and still expect "electron" to have meaning. *Action* presupposes *entity* (that which acts); we cannot have a disembodied action any more than we can have remembering without a consciousness to perform that process. To declare that all definitions are only approximate is to be guilty of the same error. The concept *approximate* is not a primary; it has meaning only in contradistinction to *exact*. It is by such trickery that the reductionists use the concept *memory* while ignoring its antecedent concept *consciousness*. This is the same error committed by computer experts when they refer to a computer's retrieval system as its "memory." They follow the same pattern when speaking of the computer's "learning" abilities.

Computer scholars have borrowed, perhaps unwittingly, the reductionist's redefinition of "learning" when describing the computer's *performance alteration* process. When a computer system compares newly sensed data with previously accumulated data according to programmed evaluation instructions and thereby modifies its actions, it has not "learned"; it has altered its performance. But this is learning, according to the reductionists' dis-

tortion of the term. What did the reductionists do to the historical concept of learning? They broke it off from consciousness in order to make way for the degeneration of memory to a function independent of life. Dr. Efron reports:

The link between the concept of memory and the concept of consciousness was explicitly broken when "learning," like all other concepts of mental functions, was redefined in the twentieth century. Once the concept of consciousness was eliminated from the concept of "learning," it necessarily vanished from the concept of memory.⁵

"When a computer system compares newly sensed data with previously accumulated data according to programmed evaluation instructions and thereby modifies its actions, it has not 'learned'; it has altered its performance."

The reductionists had narrowed down the meaning of learning to cover "only . . . the *alteration* of behavior or of performance as a result of a *previous experience*." This is most adequate for describing the "learning" process of computers. It also fits perfectly for describing the decomposition (alteration) of the human body after a fatal heart attack (previous experience). A corpse advancing in putrefaction, a computer varying a design process to accommodate new data combinations, and a scientist discovering the means to thwart a disease are all engaged in "learning." This is no more absurd than some of the applications of the new definition

of learning found by Dr. Efron in the field of biology and some I have found in the field of computers.

H. O. Simon, in his article "The Shape of Automation," states, "We can now write programs for electronic computers that enable these devices to think and learn."⁶ His "proof" is similar to that presented by other writers; he shows that a computer can be programmed to run a factory entirely automatically, detecting and compensating for deficiencies, recognizing variations, etc. In "The Psychology of Robots" Henry Block and Herbert Ginsburg say the computer is learning when it uses sensory devices to seek data, store them, evaluate them, and react to them as programmed.⁷ (Unexpected results reinforce the notion that the machine "learned.") G. Rattray Taylor, in an article on androids, explains the game-learning process of a computer thus: The rules are programmed in and the computer discovers the best move "substantially in the same manner [as] you and I . . . by looking at a lot of results and noting which ones pay off." (Note the embarrassing spectacle of a scholar stating the case and pretending to have thereby explained it!) He admits to altering the definition of learning, or to sensing that he is using an altered definition, when he says, "Unless, therefore, we define the word 'learn' in a very narrow way, we are bound to speak of these machines learning."⁸ Taylor may be so bound, but, as we are interested in explication, not drama, we will use clearer thinking.

THE distinction between human learning and computer learning is so profound that it is preposterous that the two processes share the same name. Dr. Efron tells us that, before the reductionists changed it, the term "learning" referred to

the acquisition of perceptual discriminations, acquisition of motor skills or habits, problem-solving, adaptation, association, "insight" solution, secondhand concept acquisition, and . . . the discovery of new conceptual knowledge.⁹

"The distinction between human learning and computer learning is so profound that it is preposterous that the two processes share the same name."

Only part of this list can be made to fit the computer "learning" process, whereas all are needed *in combination* to describe the achievements of the human consciousness. Furthermore, the abilities of the computer are totally and inextricably tied to *measurement*—specific, carefully detailed *quantification*. All computer programming and evaluation are carried out in terms of mathematics, whereas the human mind can perform feats of recognition, evaluation, and general conceptualization without reference to specific measurement. Reflect on how, after practicing algebra, you are able to make exchanges between both sides of the equation, skipping whole steps and sometimes even "seeing" the solution without performing any of the steps. Consider the differentiation and integration process of human value formations. Such words as "intuition," "curiosity," and "sentiment" have implications in human learning completely unanchored to either measurement or logic—those twin essentials of the computer.

Since it has come up, let's pause a moment and look at computer "logic." Logic, for a computer, refers not to the comprehensive art of noncontradictory iden-

is, therefore, no more than another in the long line of magnificent technical but nonconscious achievements of the mind of man.

I hope my point is now clear that we must stop and *analyze* when our common sense warns of questionable theories and semiclear pronouncements by the "experts." It is not an easy task, but we must take the responsibility or we will find ourselves very much like the computer in respect to "garbage in—garbage out." When we see computer garbage output, we cor-

rectly question the input. No less is required on the human level if we want to break the grip of the experts. This is particularly important when the experts fall for contradictory definitional traps or when they forget the courtesy of labeling their stories "fiction." Samuel Butler, at least, did not fail us in that respect.

Except that it gave his compelling story a good, old-fashioned midnight eeriness, the machines of Erewhon need not have been destroyed, after all.

Grandview, Missouri

Notes

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2. Robert Efron, "Biology without Consciousness—and Its Consequences," *Perspectives in Biology and Medicine*, vol. II, University of Chicago Press, 1968, pp. 9–35.
3. *Ibid.*, p. 18.
4. See "The Stolen Concept" by Nathaniel Brandon in *The Objectivist Newsletter*, January 1963.
5. Efron, p. 26.
6. H. O. Simon, "The Shape of Automation," *Perspectives on the Computer Revolution* (Englewood Cliffs, New Jersey: Prentice-Hall, 1970), pp. 161–67, repr. from *Management and Corporations*, 1985, Anshen and Bach,

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9. Efron, p. 25.
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COMMUNICATION

*the key element to
prisoner of war survival*

LIEUTENANT COLONEL BOBBY D. WAGNON

OF all the significant events in America in 1973, probably the happiest news was the return of the prisoners of war from the detention camps of North and South Vietnam. Analysis of the psychological condition of those POW's seems to suggest that they survived their experiences as prisoners far better than did Americans in other similar situations, particularly the Korean conflict. News stories and magazine articles about POW's stress that communication was the key element accounting for the better condition of the Vietnam POW returnees.

Like communication in the larger world, communication in a POW society serves three roles: (1) it makes possible social interaction; (2) facilitates group dynamics; and (3) serves as a necessary tool for the socialization and indoctrination of new group members.¹ Articles concerning the release and debriefing of American servicemen held as POW's in Southeast Asia have made clear the importance of communication in this setting. A conclusion already drawn is that a strong communication tie among Vietnam war POW's was a primary factor in preventing the psychological breakdowns that were common among American POW's held during the Korean conflict, where few such ties existed. The point has been made by Lieutenant Commander John S. McCain III, U.S. Navy, who was shot down over Hanoi on 26 October 1967 and released in the spring of 1973:

As far as this business of solitary confinement goes, the most important thing for survival is communication with someone, even if it's only a wave or a wink, a tap on the wall, or to have a guy put his thumb up. It makes all the difference.²

There were many differences between the POW groups in Korea and those in Vietnam. The majority of American POW's

in Korea were young draftees, serving in the Army infantry. Many of those young soldiers who succumbed to so-called "brainwashing" were young men who had never had any real understanding of the nature of democracy or any high degree of identification with the principles and morality of a democratic system.³ Almost all POW's held in Southeast Asia were older officers and pilots. The Southeast Asia group had a far better grasp of why they were in combat, had volunteered to be there (by becoming pilots), and were thus better prepared to resist POW stress, although not entirely immune:

The shock of capture is one of the most traumatic overwhelming, stupendous, psychological reactions that can happen to an individual. . . . It is the complete and final cutting off of all you've ever known, all you've ever dealt with, all that's ever been familiar. . . .⁴

Communication with other POW's is the means to integrate into a society to develop a new "familiar."

Communication as an Element of POW Social Interaction

Social interaction is the principal way to establish and keep in touch with the new reality. POW's in Vietnam depended on each other for news, support, and sanity. For those who were unable to make a contact, the price was high.

Some men cracked under the hardship and strain. "In extreme cases," Kushner said, "men would lie on their beds in fetal positions, sucking their thumbs, calling for mama. One of the men sat on his bed with a blanket over his head for two years."⁵

POW's interned in South Vietnam came off the planes in 1973 at Clark Air Base, Philippines, in much worse psychological condition than those imprisoned in the

North. Military analysts found an explanation for this: "Most prisoners held in the South by the Viet Cong suffered an even worse fate. Chained in separate cages, they were kept in total isolation."⁶

methods of communication

For the men fortunate enough to be imprisoned near other Americans, the only roadblock to establishing communication was the method. POW debriefings indicate that a variety of methods was used. One of the most common was the "tap code." The rudiments of tap code are taught to Southeast Asia-bound men at the Jungle Survival School (JSS) in the Philippines. It is a simple code based on the following arrangement of the alphabet, omitting the letter K. The first taps identified the horizontal line. The second taps identified the vertical column. Hence an "S" would be four taps followed by three taps.

	code block				
	1	2	3	4	5
1	A	B	C	D	E
2	F	G	H	I	J
3	L	M	N	O	P
4	Q	R	S	T	U
5	V	W	X	Y	Z

The communication here was very good. We would tap between rooms; I learned a lot about acoustics. You can tap—if you get the right spot on the wall—and hear a guy four or five rooms away.⁷

Variations on this code, including abbreviations, are possible. Special tap codes speed up the process, thereby lessening risk of detection.

With the prisoners' special tap code, . . . he "could send a message through five rooms

and get an answer back in ten minutes." We really got pretty fast at it.⁸

There were situations—for example, single-cell buildings or unusually alert guards—which made use of the tap code impossible. When paper and pen, or their practical equivalent, were available, notes were passed.

Notes were passed in the latrine, exercise and prayers were kept up, and a camp chronicler was even appointed to record the history of the captivity.⁹

In the following example, the exchange of notes was the only contact the narrator had with another American for the duration of his Korean POW experience.

One day, however, I glanced out of my door (I was not allowed outside the cell except for a specific reason) and noticed, in amazement, another American dressed in prison garb, using the facility. Deciding this was perhaps the only opportunity I would ever have to make a contact, I quickly wrote a note to give to the American . . . I then mentioned to the guard that I was sick and rushed to the latrine. The guard was unable to see the other prisoner so he paid no attention to my actions. As soon as I got close enough, I threw the note to my fellow American and ran back to my cell.

A couple of days later, I saw my new friend again, sitting on the slit trench. As I watched he took a note from his pocket and placed it in a crack in one of the boards near the trench. When he was finished, I asked my guard for permission to relieve myself, and picked up the note.¹⁰

When facilities prevented use of taps and notes, the POW's found other methods of contacting their comrades.

I had good communications, because there was a door facing the outside and a kind of louvered window above it. I used to stand up on my bucket and was able to take my toothbrush and flash the code to the

other prisoners, and they would flash back to me.¹¹

There were some disadvantages to the use of informal, spontaneous codes. Insignificant actions and gestures could be seen as possibly meaningful. "One day, one of those prisoners, looking straight at me, while his guard was a few steps away, whistled 'Plaisirs d'Amour.' Was he trying to convey anything?"¹² A prisoner might torment himself for months, trying to find the "hidden" meaning in such an experience. When contact was so limited, the thought of a wasted "conversation" could be maddening.

penalties for communicating

Because the guards knew the value of communication as well as the Americans did, they severely punished men for their attempts at contact. The following quote from Commander McCain is part of an incident resulting from his being caught tapping the wall:

When I said that, the guards, who were all in the room—about 10 of them—really laid into me, kicking and laughing and scratching. After a few hours of that, ropes were put on me and I sat that night bound with ropes. For the next four days, I was beaten every two to three hours by different guards. My left arm was broken again and my ribs were cracked.¹³

For those men who were not actually caught communicating but who were thought to be in possession of the code, punishment was equally brutal.

Prisoners were hung upside down, from beams, until they were ready to talk, made to stand for hours without being allowed to move, and forced to crawl through latrines filled with human excrement. They were beaten with clubs and rifle butts.¹⁴

The need to communicate with their

fellows was intense enough, however, to drive POW's to risk anything in order to continue.

A lot of it was my doing, because they realized far better than we did at first the value of communication with our fellow Americans. When they caught us communicating, they'd take severe reprisals. I was caught a lot of times. One reason was because I'm not too smart, and the other reason was because I lived alone. If you live with somebody else you have somebody helping you out, helping you survive.

But I was never going to stop. Communication with your fellow prisoners was of the utmost value—the difference between being able to resist and not being able to resist. A lot depends on the individual. Some men are much more self-sufficient than others.¹⁵

psychological effects of communication

The emphasis on communication produced a number of strange results. During the Korean POW experience, when contacts were few and "brainwashing" commonplace, American POW's grew fearful even of each other. The following refers to a contact made in a Korean repatriation camp, two days before actual release:

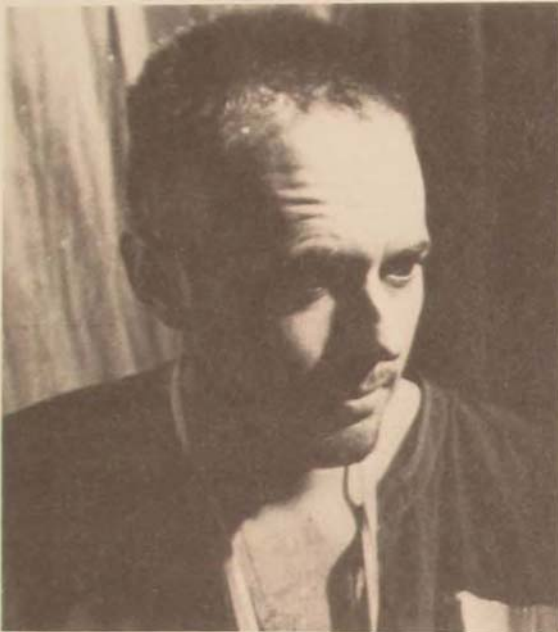
Even though Frank Schwable was an American in prisoner-of-war garb, I was slow to trust him, being suspicious of everything and everybody, and judging from his restraint, he felt the same way about me.¹⁶

There are a number of examples of Americans escaping from Korean camps, running into each other in the wilderness, refusing to speak to each other, and continuing independently.

Sometimes specific human contact was not necessary to remind a POW that he had a society. Other contacts might be enough to "fix" him back into his group. The POW's in Vietnam were primarily reinforced by the direct support of the

pow society, but British correspondent Philip Deane resisted Korean brainwashing through the help of a completely different and much larger society.

Then they made a mistake. They gave us Robert Louis Stevenson's *Treasure Island* in English, and I read it fourteen times in succession, casting off the world of Capitalism, Socialism, Communism, Stakhanovism, and plunging desperately into that



North Vietnamese sources released numerous photographs of U.S. prisoners, here a Navy lieutenant, to substantiate their claims of humane treatment of prisoners.

forgotten world of a child's imagination, with pirates and treasures and overworked clichés. I recaptured my childhood, then my youth, the books I had read, the men I had known, the power to think, I could read Marx again, and question myself honestly without fear.¹⁷

Deane trusted Robert Louis Stevenson. He felt no need to be on guard with the author; the communicating between book

and man was open. In the Vietnam prison camps, the pow's so totally distrusted their captors that they had a tendency simply to invert whatever their captors told them and believe that. Sometimes, however, some genuine good news sneaked through and bolstered spirits:

The North Vietnamese gave us very little except bad news about the U.S. We didn't find out about the successful moon shot (in 1969) until it was mentioned in a speech by George McGovern saying that Nixon could put a man on the moon, but he couldn't put an end to the Vietnam war.¹⁸

Communication as a Facilitator of Group Dynamics

Perfecting methods of communication, resisting punishment for engaging in communication, and instilling in fellow prisoners the trust necessary to reach out and try to communicate helped to create a pow society. The risks necessary to maintain links welded the community, particularly in North Vietnamese pow camps. From this social interaction developed groups so closely knit that they recognized their own sociological status and consciously sought to create a strong, supportive society. The group dynamics of a pow society embody the two thrusts, leadership and cohesiveness. Awareness on the part of pow leaders that men need a strong group with which to align themselves is one reason Vietnam pow's apparently weathered their experiences so much better than their Korean War predecessors.

Deciding the source of leadership in a pow society is a simple matter. Military tradition dictates the senior ranking man as commander; the "Code of Conduct" requires him to accept command and requires all other military personnel to subordinate themselves accordingly. "If I am senior I will take command. If not I will





The Korean POW Experience

The barrack-like structures (far left) near Chiklong, North Korea, were believed to house enemy-held U.N. prisoners, when photographed in March 1952 by USAF jet reconnaissance planes. The prisoners (some waving) are unidentified, and the buildings bear no markings, despite Communist promises to mark all POW camps. . . . A Communist liaison officer (lower left) leaves the Panmunjom exchange site in April 1953 after agreeing to exchange sick and wounded prisoners. . . . Freedom Village at Munsan-ni, Korea, (left) was the gateway to freedom for U.N. troops being returned from imprisonment in Communist camps. . . . In Operation Comeback thousands of Chinese and North Korean Communists were released from POW compounds in Korea after renouncing Communism for freedom. At Keelong, Formosa, (below) in January 1954 a crowd and band greeted ex-Chinese soldiers arriving via LST from Korea.



obey the lawful orders of those appointed over me and will back them up in every way."¹⁹ Among the POW's held in North Vietnamese camps were senior officers capable of handling this particular challenge.

It was apparent that the POWs held in the North were in generally better health than the men imprisoned elsewhere. This was ascribed to the improved diets and facilities provided by the North Vietnamese in the latter stages of captivity, and to the strong leadership asserted under the military discipline that prevailed in the camps. (It was this very lack of self-imposed military discipline by US servicemen that helped bring about disaster in the POW camps of Korea.)²⁰

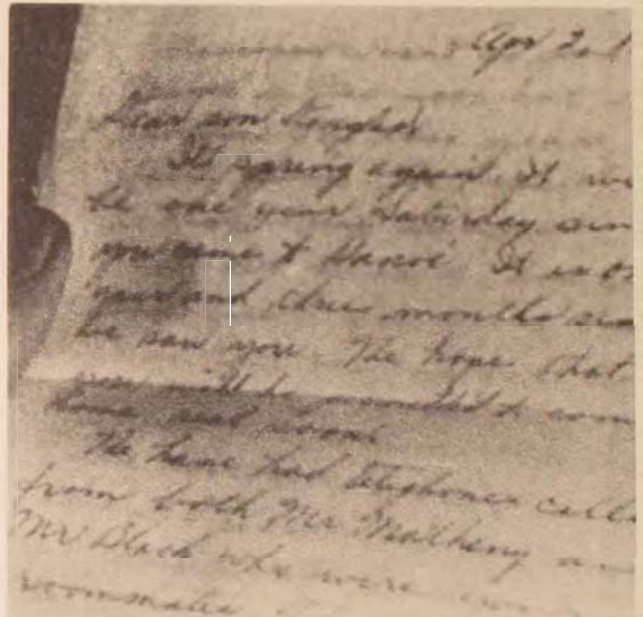
Military custom requires that a POW camp be run as a military organization. The guidelines are basically limited to Sections III, IV, and V of the "Code of Conduct." The military model is an excellent one for a POW society. The POW's are all familiar with it, and it offers a very complete (and rigid) pattern into which the men can fit. The POW's in North Vietnam elaborated somewhat on the guideline.

Prisoners' over-all commander, Air Force Colonel John P. Flynn, formally organized the camp (old French prison in downtown Hanoi) as the 4th Allied POW Wing.²¹

Over the years, the POW Wing gradually established a military command structure with local commanders, executive officers and deputies in charge of operations, intelligence and training. . . . The senior officers within this group exercised far-reaching powers. The wing command even promoted three sergeants to officers with the understanding that the commissions were subject to review and approval by the Pentagon, White House and Congress. . . . Working with their own appointed chaplains, one group of POWs compiled an abridged Bible from memory and the wing tapped its own historian to chronicle the story of the camps.²²

leadership—formal military roles

In addition to providing the pattern for a strong society, the 4th Allied POW Wing also gave the POW's something to do, roles to play. The implications of this are numerous. First, the wing—by its very formalized existence—connoted control and discipline. The men were not on their own; they were accountable to recognized



Letters from home were always a fillip for morale, but whether this one is what it purports to be is anyone's guess.

authority and a chain of command. Second, military organization gave weaker men support and gave strong men support in times of weakness. Commander McCain, speaking on this subject, agreed that ". . . it was also valuable to establish a chain of command in our camps, so our senior officers could give us advice and guidance."²³ Third, the structure and assigned tasks gave the POW's direction. Responsibility, even if limited to passing



A not-uncommon experience of U.S. prisoners in North Vietnam was being paraded through the streets of Hanoi. The USAF officer standing in the truck was subject for the crowd's taunting during this typical ride-by.

a tap code message from one wall to the next, gave purpose to a day. The discipline resulting from this kind of concrete, formalized assignment helped preserve the POWs' sanity.

group cohesiveness

Cohesiveness, as well as leadership, was necessary to create the POW society. In the Southeast Asian setting of the most recent POW experiences, it was easy for

POWs to identify each other as group members. They were different from their jailers racially (black and Caucasian POWs versus Oriental guards); they spoke a different language, had a completely different culture and thought pattern. Group norms were not difficult to establish. Once the leadership reminded the POWs who they were, i.e., officers and men in the U.S. military service, the fundamental norms relevant to them were the same as in pre-POW times. The particular norms

relevant to camp experience were determined by the leadership and enforced by peer group pressure. These particular norms covered such matters as how much torture to bear before "talking," what constituted "accepting favors" from the enemy, and the amount of trouble a POW was expected to give his guards.

Group Inputs. Cohesiveness in the group was effected by two sources. The group itself strengthened its cohesiveness. POW's in North Vietnam were so well organized that ". . . in some of the prisons a series of courses in languages, mathematics, and various other 'mind-expanding' subjects were taught by fellow POWs."²⁴

Sometimes pranks served to bolster morale. The following incident took place in a camp in North Korea, after the POW's had been tortured for months because they refused to confess to American germ warfare.

One day they had decided to put one over on their captors. Someone had found a dead rat and they cooked up a plot to see just how much the Communists would fall for. They printed an Air Force serial number on two sides of a small swatch of white cotton cloth. Next they fashioned a small harness for the dead rat, and they tied string from the harness to the cloth so that it resembled a small parachute. At night they took the rat into the middle of the compound and placed it on the ground, exactly as though it had dropped from the skies via the parachute.

The next morning the first Communist interrogator who spotted the dead rat cried out in alarm, and soon a large group of guards and interrogators assembled. . . . Later the interrogators returned to call a general assembly of the POWs in order to brief them on this horrible device that the United Nations had dropped on them in the night.²⁵

This same group of men "became" jet fighters for an entire week, revving up engines before flying to the latrine, land-

ing after such trips with the help of flagmen and elaborate runways in the dust of the compound, sustaining "terrible" injuries during crash landings, etc. The guards were angry, bewildered, threatening, and finally afraid (that they would be blamed for inducing what they saw as mass psychosis). As suddenly as they had begun the game, the POW's stopped it, and enjoyed several months' respite from harassment by the now cautious guards. The triumph of sheer silliness over the nightmare of a POW camp welded those POW's into one of the few strong POW societies of the Korean conflict.

In some North Vietnamese camps, American POW's enjoyed group living. This was a major factor in building cohesiveness.

The great advantage to living in a big room is that way only a couple or three guys out of the group have to deal with the "gooks." When you're living by yourself, then you've got to deal with them all the time. You always have some fight with them. Maybe you're allowed fifteen minutes to bathe and the "gook" will say in five minutes you've got to go back. So you have an argument with him and he locks you in your room and you don't get to bathe for a week. But when you're in a big room with others, you can stay out of contact with them and it's a lot more pleasant.²⁶

Guard/Captor Inputs. The other source of cohesiveness in a POW camp can be the enemy himself. Of course, there are specific successful actions the captors can take to disrupt the cohesive society.

Many US senior officers and uncooperative prisoners of lower rank were held in solitary confinement. Navy Captain James Mulligan was kept alone for 3½ years; Colonel Risner for 4½ years and Air Force Colonel Fred Cherry for two years—with an unattended infected shoulder. Said Mulligan . . . , "You're isolated in a small cell, with no sound, no fresh air. I was kept like an animal in a solid

cage, worse than an animal. I couldn't even see out. I didn't see the sun for four years."²⁷

Depriving the men of their leadership is an effective way to destroy the group. Some kinds of torture were effective in forcing POW's to perform certain functions; torturing a man's best friend rather than him was successful sometimes.

[The Vietnamese] regularly trussed up captured pilots and exhibited them in trucks and jeeps to jeering, stone-throwing crowds; they packed some prisoners ten to a cell and dumped others in windowless 9×9 foot cubicles with only rats for companions. They withheld medical care from some prisoners in order to extract information from their cell mates, and beat others to force them or their buddies to appear before visiting antiwar activists.²⁸

Taking a man completely out of the POW society was another cohesion-destroying action of the captors.

Some POWs were forced to kneel on cold concrete floors for days, while their knees swelled up like balloons. Others were beaten with rubber hoses—under the nose so no telltale marks were left. A man would sit on a small stool, without sleep, for twenty consecutive days. Breaking on the 21st day, he gave the antiwar statements they were demanding.²⁹

The guilt feelings of the POW who did crack could be handled by the group; group norms were flexible enough in some cases to countenance "talking" after the kind of torture just described.

On the other hand, social cohesion was strengthened by the increased hatred of the enemy which torture—and neglect—provoked in the POW. A comment from a POW doctor:

"Ten good men died in my arms," Kushner said bitterly—"three in one week alone. I felt on the edge of insanity," he declared. "I had the knowledge, the training, to take

care of those people. All I needed was the equipment, the medicine—and I was unable to get it."³⁰

A number of POW's returned from Vietnam have been quoted as saying that hatred was one of the principal forces which carried them through the experience. The outside threat and the constantly reinforced concept of the captors as evil and despicable had a very positive effect on the POW society. The captors themselves, along with POW leadership and support from the lower-ranking POW's, were a force in developing cohesiveness in the POW society.

Indoctrination for the POW

The third major area in which communication is essential in a POW society is in the indoctrination process.

An elaborate grapevine eventually grew up linking most of the camps. Prisoners tended this intricate communications system by feigning illnesses to get medical transfers from one camp to another and even by incurring disciplinary transfers by baiting their captors. Wing veterans exhaustively debriefed all new prisoners on their arrival in the camps, and their reports on changing military policies, political trends and new life styles back home were quickly sent out through the grapevine.³¹

Sometimes it took great effort to get through a new prisoner's thick defenses, in order to begin the indoctrination process. Commander McCain recalls an instance:

The story of Ernie Brace illustrates how vital communication was to us. While I was in the prison we called the plantation in October, 1968, there was a room behind me. I heard some noise in there, so I started tapping on the wall. Our call-up sign was the old "shave and a haircut," and then the other guy would come back with two taps, "six bits."

For two weeks I got no answer, but finally, back came the two taps. I started tapping out the alphabet, one tap for "a," two for "b," and so on. Then I said, "Put your ear to the wall." I finally got him up on the wall and by putting my cup against it, I could talk through it and make him hear me. I gave him the tap code and other information. He gave me his name—Ernie Brace.³²

Ernie Brace had been held in Laos by the Pathet Lao and then transferred to one of the POW camps near Hanoi. In the process, he had built himself a very thick shell. Eventually, he became one of the

leaders of the particular group of prisoners at the Plantation.

precapture conditioning and training

If a free man can ever effectively prepare for POW conditions, the Americans on flying status in Southeast Asia had been prepared. The armed forces operate several survival schools; pilots, navigators, and other airborne personnel regularly attended them prior to departure for Southeast Asia. Stateside schools are located at Fairchild AFB, Washington, and Eglin AFB, Florida. These schools are in addition to formal

An International Committee of the Red Cross inspection team visits prisoner-of-war facilities in South Vietnam.



confidence and skill-building courses like the Army Ranger, paratrooper, and Special Forces schools. The Air Force Academy makes practice for POW status part of its regular curriculum.

Survival training has been a part of the academy curriculum since the school was opened and . . . all activities are "strictly supervised" by academy staff.

The current mock POW exercise is carried out during a 39-hour block of training devoted to training in application of the code of conduct. The resistance training is conducted in a "compound" surrounded by a chain link fence topped with barbed wire, and "protected" by a 20-foot guard tower.³³

Survival Schools. Since 1968, the majority of Southeast Asia-bound flyers have attended both the Fairchild AFB Survival School and the Jungle Survival School at Clark Air Base in the Philippines. The author attended both schools in 1969 and found that the courses in both schools simulated many of the anticipated POW problems. The handful of POW's released prior to 1973 lent their expertise in helping the school organizers to build mock-ups of real North and South Vietnamese POW camps, torture apparatus, and interrogation rooms. Students at the schools were treated as much like POW's as reasonably possible. The knowledge that they were actually on an air base prevented this simulated POW experience from being psychologically identical to the real thing, but it was almost identical physically. Men even spent time in "The Box" (a very small metal or wooden container into which POW's were crammed—and left—until they broke from claustrophobia or pain).

In addition to having simulated POW experiences, JSS students learned much potentially useful information about sanitation, survival equipment (and its manufacture and repair), diet, first aid, jungle plants, and wildlife. This information was geared

toward helping a downed flyer survive in typical Southeast Asia terrain. The tap and hand codes mentioned so often by former POW's were also taught at JSS. Here, too, men were reminded of the "Code of Conduct" and its very practical and real application to a situation in which the men at the school might find themselves within the year.

Informal Reinforcement of Capture Possibility. Once on flying status in Thailand or South Vietnam, men were constantly reminded of the possibility of capture. This happened as they put on their survival vests (with the many little pockets containing dozens of ingenious devices, carefully designed to carry a man through the first few days until he could be rescued), sat through intelligence briefings, waited for long overdue flights of close friends, and took off themselves on mission after mission. Even close friends rarely speculated about the possibility to each other, but they did little things like jogging without shoes to toughen their feet, "just in case." Combat flying boots are one of the first things a POW is divested of, and a tender-footed prisoner won't get far in the jungle. This awareness and the JSS training made the indoctrination of men into the POW societies in Vietnam far easier than in previous wars and conflicts.

peer group pressure

The peer group in the POW society also helped indoctrinate the POW's. There were some failures, however, according to information released through American news services. Eight enlisted men, banded together in an informal "Peace Committee," refused orders from their superiors and voluntarily delivered antiwar broadcasts for the enemy that far exceeded anything the North Vietnamese were able to force out of the other prisoners.³⁴ Charges

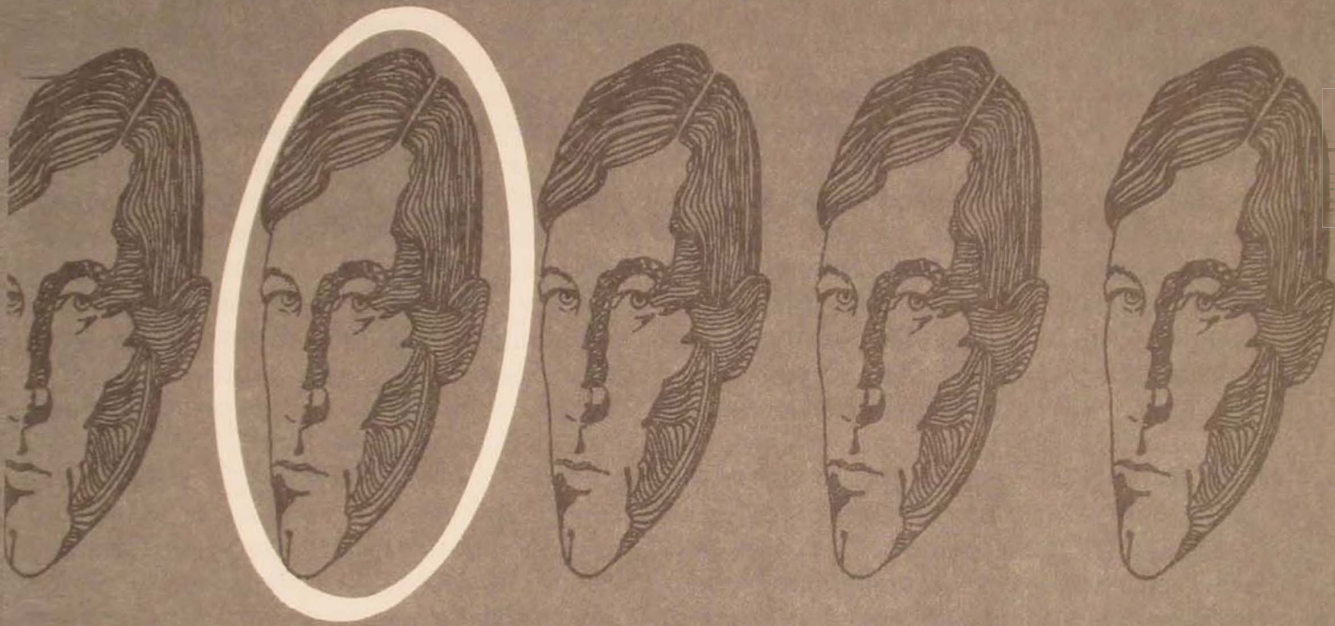
were also levied against two officers for misconduct, mutiny, and aiding the enemy. The Pentagon later dropped all charges against both the officers and enlisted men for lack of supporting evidence and for the expressed belief that the ten men had suffered enough.³⁵ However, prisoners who had doubts about the war, or gave statements to protest groups, or were thought to have collaborated with the enemy were certainly judged by the other prisoners. Of the 566 known POW's from Southeast Asia, only the ten mentioned were formally accused of failing to adhere to the standards of the "Code of Conduct." Peer group pressure and group support must, indeed, have been strong to keep that number so small.

THE impact of communication on the POW society, and thus on the prisoner of war himself, is clear. With good communications, a strong, supportive society can be formed and maintained. Statements from former POW's make plain the importance of contact with other POW's; such contact was vital for survival. Without communication, a POW society cannot be formed, thus leaving the POW isolated and in a one-to-one relationship with his captors. When this situation exists, the POW is likely to suffer severe psychological damage and to give to his jailers the information they want from him. Good communication is truly the key element, then, to survival in a POW situation.

Air War College

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**ASSESSING
THE ASSESSMENT CENTER**
new dimensions in leadership

MAJOR PETER HENDERSON

THE mission of Air University is to prepare officers of all grades and specialties for command of, and staff duties within, all types of Air Force organizations.¹ Implied in that mission statement is the requirement for strong Air Force leadership at all levels of staff and command. Air Force professional military education (PME) schools are devoting considerable talent and energy toward leadership education as each labors to fulfill its own specific requirements. The problem is that leaders and educators alike have been unable to agree on a specific interpretation of leadership. What makes a leader, how does one recognize leadership when it occurs, and how is leadership taught?

The USAF Chief of Staff, General David C. Jones, has said that leadership is a "nebulous quality" that turns failure into success.² Although we can easily see what it is that occurs as a result of leadership, we still do not understand the nature of it. It would be difficult to find a topic more in need of clarification than leadership. In an article in *Air University Review*, General Ira C. Eaker commented that leadership is still a "critical factor for the military professional."³ General Eaker went on to enumerate his favorite qualities of leadership, heading the list with "courage."

All outstanding leaders seem to have their favorite leadership attributes. For General Jones, it is the ability to solve problems.⁴ Other leaders have named other attributes. Squadron Officer School (SOS), the Air Force's junior officer leadership school, actually publishes a list of attributes in one of its textbooks.⁵ Our concern with leadership in the world of professional military education is not a problem of naming attributes but one of limiting the description of leadership to a measurable or observable quantity that we can isolate and evaluate.

A relatively new idea for promoting de-

velopment of leadership is known as the Assessment Center method, by which students go through a program of activities under the eye of expert faculty members. As a method of observation and evaluation of behavior, the Assessment Center can contribute to a better understanding of the nature of leadership; it can provide specific dimensions of leadership that can be observed in controlled conditions and used for improving leadership education in precommissioning programs and in professional military schools.

We are deluged with definitions and theories of leadership. The primary difficulty with many popular leadership theories is that they are based on either intuitive assumptions or attitudinal surveys. For example, the Blake-Mouton Managerial Grid⁶ is taught as a viable theory of leadership and management behavior in most courses of leadership/management instruction. This theory is popular because it is logically constructed and leads one to believe that there is a "best" style of leadership behavior. It is also a favorite in the classroom environment because each student can "learn" his dominant style of behavior by means of a simple paper-and-pencil test.⁷

On the other hand, some leadership theorists totally reject the idea of classroom instruction in leadership. Dr. Fred E. Fiedler, who has conducted a great deal of this country's research on leadership, states that no one has established any direct correlation between the amount of training a leader has had and the performance of the group he leads.⁸ However, Dr. Fiedler's own theory, the Contingency Model of Leadership Effectiveness, is grounded in behavioral assumptions based on attitudinal surveys.⁹ These are examples of two of the more popular theories of leadership being used in leadership courses today. The point is that they are based on

generalized statements which attempt to explain behavior and are not particularly useful in helping students *develop* their own leadership skills. Our Air Force students, for all their study of leadership theory, are still unclear as to their personal concepts of leadership and what they must do in any given situation to provide good leadership.

It is my opinion that educators have been looking in the wrong direction for assistance in leadership education within given fields. The Assessment Center, as a method of behavioral measurement and individual feedback, can provide the professional educator in any field with specific dimensions of leadership. This method can increase the instructor's ability to recognize individual acts of leadership in group situations and properly counsel individual students on their leadership skills. In the Assessment Center the emphasis is on observed behavior rather than theoretical abstraction. Before we analyze the method, let us examine its history.

How did the Assessment Center begin?

According to most sources, the Assessment Center was apparently first conceived by the Germans in 1911 for purposes of officer selection.¹⁰ It was also used by the Office of Strategic Services during World War II for selecting secret agents.¹¹ The British Royal Army Selection Board continued to use a variation of this program after World War II in selecting young applicants for Sandhurst, the Royal Military Academy. It is interesting to note that Squadron Officer School's famed Project X was originally designed as a copy of the British program.¹² Since its beginning in 1951, the sos Project X has become the focal point for that school's leadership program because of the emphasis on situa-

tional and observable leadership behavior in a problem-solving environment. That is the legacy of the Assessment Center method.

Sometime after the start of Project X, representatives from the U.S. Army Infantry School at Fort Benning, Georgia, borrowed the plan from sos and designed a leadership "confidence" course of their own. That course continues to be a valuable part of infantry basic training, and similar courses are being established at other Army schools.¹³ The Assessment Center method is a tried and proven way of evaluating leadership behavior in an outdoor problem-solving course.

In this outdoor form, however, it is not fully suited to the needs of PME, the major command leadership academies, or the precommissioning programs for developing new ways of instructing in leadership behavior throughout the full spectrum of Air Force management activities. It is in the civilian sector that the Assessment Center method has made the largest contribution.

American Telephone and Telegraph, in looking for new management development and training processes, took the lead 15 years ago and attempted to identify the variables related to success by applying the Assessment Center ideas.¹⁴ Today, AT&T subsidiaries are operating some fifty Assessment Centers nationwide. They are processing approximately 10,000 personnel annually, identifying potential candidates among people eligible for first-line management positions.¹⁵ The Assessment Center method is also being applied by IBM, General Electric, and J. C. Penney, as well as many state and federal agencies, to help in the selection of first-line supervisors and top Civil Service candidates.¹⁶

For a while the only full-time Assessment Center operated by the U.S. Air Force was located at Wright-Patterson AFB, Ohio. Designed specifically for the

assessment of candidates for civilian positions (GS 12-14) in the Aeronautical Systems Division, the center was operated on a trial basis January through June, 1974. It was so successful in fulfilling its objectives of identification and development of high-potential managers that it is now refunded on an annual basis.¹⁷

The U.S. Army operated a temporary Assessment Center at Fort Benning. The center's mission was quite extensive: to test the assessment concept as a pre-commissioning screening device and as a leadership career development technique, and to determine whether the concept was valid for Army-wide use.¹⁸ An interesting fallout from this research project was the development of composite profiles of junior officers and NCO's based on the accumulated behavioral data. This composite provided the school with valuable information on the capabilities and anticipated needs of its future students.¹⁹ The program was discontinued in 1974 for lack of funds, but the data are still being researched by the Army Research Institute.²⁰

Most recently, Squadron Officer School re-examined the Assessment Center method. Based on the favorable results obtained by the project at Wright-Patterson, SOS initiated a pilot program in 1975. They have since added the Assessment Center method to their leadership curriculum as another means of identifying and developing those leadership behaviors and skills most needed by junior officers in their respective staff and squadron duties. A full examination of their work should be made by any military educational institution seeking to upgrade its leadership education curriculum.

What is the Assessment Center method?

The Assessment Center is a method of defining, observing, and measuring behavior.

The Assessment Center method uses a system of actual work-related problems and situations in which the behavior of individuals can be observed and objectively assessed. The students participate in these situations under the watchful eye of the assessors, who are specially trained for this activity and who have themselves undergone assessment. The behavior of the student is recorded and later classified in accordance with specifically tailored "dimensions" or skills. These dimensions are the actual leadership skills that have been identified as essential qualities for the position being considered, or for the particular types of duties the student will be assigned in future Air Force assignments.²¹

The purpose of the Assessment Center, as used by most civilian corporations, is to evaluate the specific skills, or dimensions, of the candidates in order to determine their fitness for promotion to a particularly important position. It is designed as a supplement to aid managers in making objective and rational decisions about the promotions of their people.²² As will be fully explained later in this article, however, the Assessment Center's value to Air Force leadership education lies in its use as a developmental system rather than as a placement system.

The typical Assessment Center program consists of a one-week operation: 2 to 3 days for the observation of exercises and 3 to 4 days for the assessment and resolution process. Specially trained observers are selected from management positions similar to the positions for which the candidates are being considered. The candidates are placed into six-man groups, which participate in a series of standardized exercises such as management games, unstructured and structured group discussion scenarios, in-basket tests, one-on-one interviews, briefings, speeches, and written

problem-solving exercises.²³ Not all the exercises are conducted with the six-man groups, but all are designed to bring out some dimensions of management or leadership behavior. Most of the exercises require intense group interaction, since management and leadership require getting work done through people.²⁴ Most of the exercises are realistic role-playing scenarios in which each participant has a task, and he can do as much or as little with his role as he wants.

There are typically three assessors observing each six-man scenario, although that ratio can vary according to the needs of the educational situation. Each assessor watches only two of the participants, recording their behavior as the problem situation moves toward resolution. The assessors eventually observe all the candidates over the full period of time and later meet to compare notes, discuss behaviors, and prepare their evaluations. During the "assessment phase," the assessors must catalog their observations in terms of the dimensions being measured. They can later evaluate each participant's leadership ability based on the number and quality of the leadership dimensions he displayed.

What are the dimensions?

The behavioral dimensions, or skills, are the backbone of the Assessment Center method. The dimensions provide the method with its inherent flexibility and adaptability. A dimension is a capability, talent, or skill area that encompasses specific behaviors. These behaviors are examples of abilities in the particular dimension, and they can easily be grouped and reliably classified in those particular dimensions. The dimensions are not all-inclusive; rather they are common areas of concern as agreed upon by experts in the particular area. The dimensions of

leadership valued in the chaplain's area of activity, for example, might not be the same as those valued in the personnel or comptroller fields. The dimensions valued in precommissioning education will likewise be different from those valued in the Air War College environment, even if only in degree and intensity.

The following dimensions are a few of those used by the Aeronautical Systems Division in its Assessment Center at Wright-Patterson: energy, forcefulness, flexibility, stress tolerance, risk taking, originality, and problem solving.²⁵ These specific dimensions were not derived from arbitrary or academically intuitive sources; instead they were obtained by exhaustive surveys of managers who occupied the positions of leadership for which the Assessment Center was assessing candidates.

There are many more dimensions recommended by the commercial consultant firms that develop Assessment Center programs for industry. Primarily, the dimensions are job-performance related. The lists provided are only suggestions for developing a set of dimensions peculiar to the using activity. The dimensions used by any institution should be obtained through as many ways as possible, including surveys of professional literature, job analyses, interviews, and questionnaires.

All these dimensions are related to leadership behavior because they specifically relate to task accomplishment through people. One of the biggest problems in the area of leadership training has been an inability to see the forest for the trees. Many leadership schools are trying to develop a cognitive understanding of leadership, when the real need is to teach and develop the *skills* or *dimensions* of leadership. The Assessment Center, used in the developmental manner, facilitates that instruction by creating situations in which the specific skills, or dimensions,

can be observed, evaluated, and used for the leadership development of the student.

How good is the Assessment Center?

A review of all validity studies since 1956 concerning Assessment Center methods reveals that the assessments were valid and were consistently correlated with several criteria. Predictive accuracy was highest for job potential, followed by progress, and then job performance. The Assessment Center was more efficient than traditional methods of evaluation, such as paper-and-pencil tests.²⁶ The popularity of the Assessment Center method results from its great flexibility in adaptation to different jobs and job levels and inherent potential for higher degrees of content validity (job relatedness).²⁷ It has endless implications for training, as a tool for planning training needs, as a career-planning vehicle, and as a learning experience per se.²⁸

The Assessment Center at the U.S. Army Infantry School was highly rated by school officials. In a final report, one official stated that the center presented "excellent hands-on performance-oriented leadership training"; it was also reported that students called the experience the "best leadership training they had ever received."²⁹

How does the Assessment Center method apply to Air Force schools?

As mentioned earlier, the original purpose of the Assessment Center method was personnel placement or promotion evaluation. Whereas industry primarily uses the Assessment Center method for job placement purposes, the Air Force should use it for the leadership development and education of the professional officer.

Each school using the Assessment Center method should tailor the method to its own needs based on the curriculum objectives

and length of the course. Preparation should include having key faculty members attend an active Assessment Center to observe the process from beginning to end. It would not be necessary to hire a civilian consulting firm to establish the Assessment Center, as most civilian corporations do. There is sufficient expertise and material available within the resources of Air University to establish a developmental Assessment Center method in any Air Force school. Squadron Officer School has used only minimum outside resources in establishing their Assessment Center program.

The reader may be thinking at this point that Squadron Officer School, with its Project X, management games, group discussion seminars, and field activities, provides a unique proving ground for the Assessment Center method. But what about the other professional schools? As a matter of fact, the Air Command and Staff College, Air War College, Chaplain Orientation Course, Professional Military Comptroller Course, Professional Personnel Management Course, and the USAF Senior NCO Academy are all engaged in various forms of leadership and management instruction that involve group projects, individual exercises, and group discussions. Furthermore, the AFROTC AS400 Leadership and Management courses provide excellent opportunities to use Assessment Center techniques. The cadet corps training environment would lend itself well to this method. Almost all our leadership schools attempt to develop leadership and management expertise in certain areas at various levels of authority. The Assessment Center method provides dimensions applicable to each of these levels of expertise. It remains for the faculties and staffs of the various Air Force and other service professional military education establishments to determine the specific dimensions and criteria to be measured and developed.

How is Assessment Center information used?

The information generated by Assessment Center activities should be disseminated in feedback sessions between faculty instructors and their students. The faculty member, who should also be an assessor, should communicate to the student exactly what he did and did not do in terms of specific leadership dimensions during the exercises. Usually there is more information than the student can handle, because the assessment technique is so thorough. These feedback and counseling sessions are the most important aspect of the Assessment Center in the developmental method; they must be done carefully by faculty members who are well qualified.³⁰ The faculty member should pick out only the most important information that is most closely related to the specific needs of the student.

In the educational environment, information accumulated on each student as a result of the Assessment Center method should be used for school purposes only. This is an important point. Evaluations obtained may also be used for determination of graduate standing, but the information should *not* be included in any official documentation that leaves the school and becomes part of one's official military records. Since the objective of this use of the Assessment Center method is for *developmental* purposes, the information should not be used for promotion selection information. It may well be of considerable value for assignment information, however, and it is conceivable that at some point in the future the Air Force will see a need for the *placement* type of Assessment Center. It should be emphasized, though, that we must know a lot more about this technique before it ever replaces the tried and true "commander's evaluation."

One of the greatest benefits of the As-

essment Center method is that the student gains valuable experience from the participation itself, as he undergoes more and more assessment, since the exercises are problem-oriented and can be tailored to the production needs of the school. The faculty members will become more and more proficient at recognizing skills and abilities and will increase their capabilities as evaluators as well as their credibility with the students. Their counseling techniques will also improve. As the student recognizes areas in which he needs improvement, he can concentrate on those skills in further exercises, while continuing to satisfy the academic requirements of the school programs.

It must be repeated, in conclusion, that the Assessment Center method is strictly a method and will only be as good as the time and expertise devoted toward making it work for the particular school. As a technique, it does not provide all the answers to the questions of leadership, but it does provide an effective and objective way of measuring leadership behavior in a situational context. A great deal of time and effort must be invested in the method by each school in order to make it work. The results, as compared to attitudinal surveys, paper-and-pencil exercises, and observations of opportunity made by faculty members, should be informative and instructive for both students and faculty members. The results should be well worth the preparation if the graduates are able to say that they have a better understanding of their personal and professional leadership capabilities in their particular field and have a clear understanding of specific areas for self-improvement. The Assessment Center, as a developmental leadership education method, can *assist* the Air Force's professional leadership educational

system in accomplishing its mission of preparing officers for command and staff

duties in all types of Air Force organizations and commands.

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Job enrichment
may be the answer



MAJOR D. K. CROOCH

DO more with less!" "Manpower levels are going down!" "Budgets will be more constrained than ever!" "With all my resources decreasing, the mission is increasing!" How can we do more with less? How can we improve performance and mission accomplishment? In the face of the "gloom and doom" forecasts, what, indeed, is today's Air Force manager to do?

As we continually examine managerial strategies hoping to find *the* answer to cope with the challenges presented by increasing requirements in an environment of scarce resources, there is a growing awareness that perhaps the single most important factor in people's performance is the design of the work. However, most efforts to improve performance seem to center on improving the conditions surrounding the work. We stress improved supervisory techniques and interpersonal relations, and we try to improve working conditions. These are worthwhile efforts, but they usually result only in short-term improvements in attitudes and productivity, and the situation often returns quickly to normal.

Long-term improvements will not be made until we realize that it is the job itself which needs to be changed. If people are unhappy with the temperature in the room, adjust the temperature; but if they don't like their job, don't expect more comfortable temperatures to change their attitudes and behavior. We have to learn to make jobs more interesting.

A concept with great potential for the USAF manager in this regard is "job enrichment." The concept of job enrichment provides the manager with a strategy that will motivate subordinates and at the same time enhance mission accomplishment. The purpose of this article is to examine the concept of job enrichment, look at its utility for today's USAF managers, and discuss the enrichment process.

job enrichment—review and update

Job enrichment has become one of the most popular management buzz words. Like most buzz words, it has frequently been misused or used loosely.

The term "job enrichment" is firmly lodged in the vocabulary of managers, behavioral scientists and journalists. Managers are beginning to accept the basic theory behind job enrichment, but only at the cocktail-party level of understanding of human behavior. Behavioral scientists, ever ready to jump on a bandwagon, often have an equally shallow understanding, but a better vocabulary. And journalists have a new movement to misinterpret. The result has been that job enrichment now represents many approaches intended to increase human satisfaction and performance at work, and the differences between all the approaches are no longer clear.¹

Since the term "job enrichment" has been abused and distorted, then, we need to make our use clear.

Job enrichment is both a concept and a process concerned with changing jobs to make them more meaningful to those who perform them and at the same time to make better use of the worker's knowledge, skills, and ideas. The concept of job enrichment was crystallized with the motivation-hygiene theory of job attitudes advanced by Frederick Herzberg, currently University Distinguished Professor at the College of Business, University of Utah. His two-factor theory, first presented in 1959, departed sharply from conventional theories of job satisfaction.²

A brief review of Herzberg's findings is necessary to understand fully the concept of job enrichment.

Motivation-hygiene theory suggests that job satisfaction and job dissatisfaction are produced by different work factors. What makes people satisfied at work are factors that relate to the content of their jobs—specifically:

achievement, recognition for achievement, interesting work, increased responsibility, growth, and advancement. (Called motivators). On the other hand, what makes people unhappy at work is not what they do but how well (or poorly) they are treated. These treatment factors (dissatisfiers) are related not to the content of work, but to the context of the job. The main factors in this group are company policy and administration practices, supervision, interpersonal relationships, working conditions, salary, status and security. Because these factors describe the job context and, in their negative aspects, serve to provide job dissatisfaction, we have called them hygiene factors, symbolizing the fact that they represent preventive and environmental conditions of work.³

Therefore, according to Herzberg, superior performance can only be generated by concentrating on the "motivators."

This concept is then applied to the work itself. When we look at any job, we find three dimensions that define its parameters: the degree of completeness, the control factor, and the feedback dimension. By further specifying these dimensions, we can define an "enriched job" as follows:⁴

(1) An enriched job is a *complete* piece of work in the sense that the worker can identify a series of tasks or activities that end in a definable product for a specific recipient. These two aspects of job completeness need amplification. First is task combination. The job needs to be complete in that it has an identifiable beginning and end, is logically separable from other "pieces" of work, and is not duplicated by anyone else in the work unit (i.e., before, after, or above). Second, the jobholder should be able to identify users or receivers of the work. Work should be assigned on the basis of client relationships (other departments, external customers) or natural work units (specific set of accounts, geographical areas, or alphabetical ordering).

(2) An enriched job affords the worker

as much decision-making responsibility and *control* as possible in carrying out the work. The conditional phrase "as possible" is a recognition of the fact that it will not always be possible to extend complete control or decision-making to a job incumbent. It is important that the person have the power to act in unusual situations or circumstances. Build in as many decision and problem-solving activities that affect the service and quality levels of the work as possible. For example, the worker should have as much control as possible over such things as setting work priorities, resolving complaints and mistakes, sending work back for more information, and direct communication with other areas.

(3) The third and final dimension of an enriched job is that it provides direct *feedback* through the work itself on how well the worker is doing. The worker should not be dependent on a supervisor to know whether or not the job is being satisfactorily accomplished. Such feedback can be provided by direct user complaints, error rates, volume counts, and turnaround times.

A job having these three dimensions will therefore include: responsibility for planning task accomplishment; the freedom to exercise that plan in the completion of the tasks; and the feedback necessary to enable each worker to assess the effectiveness of that plan in accomplishing the task so as to take any necessary corrective action to insure successful task completion.

Relevant to the USAF?

What is the utility of job enrichment in the USAF? We can gain insight into this question by looking at experience in the private sector. Industry has been wrestling with the problem of job satisfaction and worker motivation for a number of years. There is a growing consensus among managers as well as behavioral scientists that

the way jobs are structured—the work itself—is critical. They have concluded that today's workers desire challenge and individual growth on the job. Unfortunately, in the interest of efficiency, today's complex organizations often rigidly structure jobs, career progression, and personal development. Work tends to be too simplified and overspecialized. Industry has found that these conditions result in decreased productivity, alienation, hostility toward the organization, increasing absenteeism and turnover, and pervasive feelings of unhappiness and discontent. The extent to which these conditions exist in the USAF is open to question. Air Force traditions and our mission in support of national objectives undoubtedly help to cushion or retard the impact of such forces. It is clear, however, that the Air Force is affected by the same social and technological trends as the rest of society and that our people will respond positively to motivation through the work itself.

Indeed, many an Air Force manager may already have recognized signs of discontent with the job on the part of his personnel—or even with his own job. What, then, do some managers perceive as good jobs? An example from experience common to many of us may help. Officers and NCO's who served a tour in Southeast Asia think of the job there as the best they have ever had. We talk of feeling a sense of achievement, recognition for a job well done, interesting work, and tremendous responsibilities. It is interesting that we felt this way about jobs with a less than desirable environment, poor working conditions, family separation, finances stretched to the breaking point, and great personal danger for many. This common experience provides a practical example of a kind of job enrichment that was not designed but resulted from the exigencies of the situation.

For another perspective, let us look at how

today's jobs are perceived by a select group of USAF middle managers. A survey of the students in the Air War College and Air Command and Staff College classes of 1974 found that 89 percent of 680 respondents felt that almost every job can be made more stimulating, interesting, and challenging. Ninety-nine percent felt that individual recognition is a key factor in employee motivation. Seventy-five percent felt people want to accept responsibility. And seventy-two percent felt that allowing subordinates to set performance standards will not result in subpar standards.⁵

Clearly, USAF managers perceive that there is room for job improvements. People want to be challenged, to have interesting work, and to be responsible for their actions. They also recognize that their subordinates want to be involved and will probably be more productive if they are.

candidates for the enrichment process

Traditionally, when job enrichment advocates have been asked where this concept will help, they have answered, "Anywhere you have problems." It was basically a symptomatic approach: look for jobs where worker attitudes are poor as evidenced by low productivity, poor-quality work, low morale, disciplinary problems, requests for transfers, and low re-enlistment rates. Of course, if these or other symptoms are present, it is the manager's responsibility to get at the cause. While this symptomatic approach to job enrichment has sometimes proven successful, it has also resulted in much misdirected activity.

Obviously, there are situations with high turnover or poor productivity in which job enrichment would not help. People leave jobs or perform poorly for many reasons: They feel they are underpaid, their supervisor is poor, the work conditions are unacceptable, or they are bored and uninterested in their

assignments. Since job enrichment is a process for making work more interesting, it can help only when the last reason mentioned is the cause of the symptoms. But another, more fundamental condition must exist before job enrichment can make a contribution: there must be a structural opportunity to redesign the job. So the first question to be asked in assessing the usefulness of job enrichment in any organization is—where are the tasks done in such a way that leaves room for them to be enriched?⁶

Structural data can provide information about the technical feasibility of job enrichment. In studying structural opportunities, the manager is attempting to determine the possibilities for assigning work on a user basis or task combination, or building better decision-making and control into the job, or providing better feedback. The existence of one or more of these structural clues does not necessarily indicate that jobs should be enriched, only that the structural opportunity for enrichment exists. Some of the structural indicators that may warrant further investigation include

—duplication of functions (Is task combination possible?)

—extensive use of specialists or troubleshooters (Do they have the best part of everyone else's job?)

—one-on-one reporting relationships (Does the person on the bottom get the leftovers?)

—the existence of general labor pools (Is client identification possible?)

—multiple authority limits (Can more authority be given to those in lower jobs?)

—divided responsibility (Can responsibility be specifically placed?)⁷

These clues should be helpful in determining whether job enrichment is possible. Whether it is desirable is usually not an easy question to answer.

steps for the process

There are specific steps a manager can take to facilitate the enrichment process once it has been decided that an enrichment effort is the course of action to pursue:

1. Select a job with which at least one member of your group or work team is intimately familiar. Define all the major tasks and responsibilities of the selected job as it is presently designed.

2. Determine criteria against which you can measure improvement or slippage resulting from job changes.

3. Brainstorm a list of changes. Generalizations such as responsibility, achievement, recognition, and personal growth must be translated into specifics relating to the work being performed.

4. Categorize all the ideas, identifying potential "motivators" and potential "hygiene" factors, into the following areas:

- a. A complete module of work

- b. New responsibility

- c. New form of recognition

- d. New feedback

- e. Growth opportunities

- f. Roadblocks—rules or procedures that will need to be changed

- g. Working conditions (and other hygiene factors).

5. Evaluate the ideas and identify those that seem to be excellent and those that seem to be good. The rest are classed as "not so great" and may be ignored.

6. If it is possible to remove roadblocks or improve working conditions, by all means do so. If the list is strong on roadblock items or working conditions and weak in the first five categories, a job enrichment effort may not be particularly profitable.

7. If the list is strong on the first five categories, implement the excellent and good items that are the best candidates for re-

shaping the job. Introduce changes gradually to allow workers time to assimilate new procedures, tasks, responsibilities, and relationships.

8. Re-evaluate the criteria for measuring the results of change.

The enriched job may not include all the original indicators, or unanticipated benefits may result.

cautions⁸

Not all jobs need enrichment. "Some jobs do not lend themselves to redesign, or would be too expensive to change."⁹ Not all people want or need their jobs enriched. "Employees may differ in their psychological readiness for enriched work."¹⁰ Before enriching jobs in the organization, the manager should obtain the support of his own supervisor. This enables the supervisor to become aware of the problems and issues involved. Few supervisors like surprises!

Managers can enrich jobs below them to the degree that they possess the leeway to give their people more autonomy in their jobs. But one cannot trade off "hygienes" for "motivators"—even if it is a good job, people still need a good job environment (status, supervision, working conditions, etc.).

Unrealistic expectations should be avoided. Many enrichment efforts have been stopped before they had an adequate chance to work out. Industry's experience has been that there may initially be a slight drop in productivity. After all, the people are learning a new job.

If job enrichment is confused with merely adding additional tasks, it will probably not work. Dr. Herzberg cites the example of the dishwasher who specialized in washing cups and saucers. After his job was "enriched," he washed silverware as well.

A typical supervisory reaction to job

enrichment is, "I'm giving away all of my authority." Once the manager becomes accustomed to the changes, he may be able to do things he had only limited time to do before, like planning.

Job enrichment is not a panacea. It is not an end in and of itself. Above all, it is not simply redesigning jobs. It must be viewed as part of a larger systems approach that includes work organization—close attention to the way work groups are made up and managed. It also includes redesign of supervisory structures, including hierarchies, reporting relationships, and levels of supervision. Finally, it includes team building, worker participation, supervisory training, creation of autonomous work teams, goal setting, performance appraisal, and turnover analysis.

A change or intervention technique is generally introduced into an organization because some aspect of the system is not working well. I feel we should become committed to job enrichment as a very potent means of breaking a dysfunctional cycle. Compared to other methods of intervention, it works fast, and it has perhaps the best chance of bringing about lasting performance improvements. It seems inevitable that job enrichment is linked to these other kinds of change. Sometimes one technique comes first, sometimes another. They may deal with different aspects of the total quality of working life, but they can all be valid starting places, and they can all enrich the job.

In the final analysis it's really up to each manager to examine the organization and determine the feasibility of the enrichment process. Job enrichment can help us to "do more with less," and that is our challenge for the foreseeable future.

Notes

1. Frederick Herzberg, "The Wise Old Turk," *Harvard Business Review*, September-October 1974, p. 70.
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3. Frederick Herzberg, "Motivation-Hygiene Profile," *Organizational Dynamics*, Fall 1974, p. 18.
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5. These data were gathered in an Air Command and Staff College Group Research effort, "Air Force Leaders in the 1980's" (June 1974), which will be published in a series of articles and papers edited by Lieutenant Colonel Franklin D. Margotta, Chief, Division of Staff Communications and Research, Air Command and Staff College.
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When people are free to do as they please, they usually imitate each other.

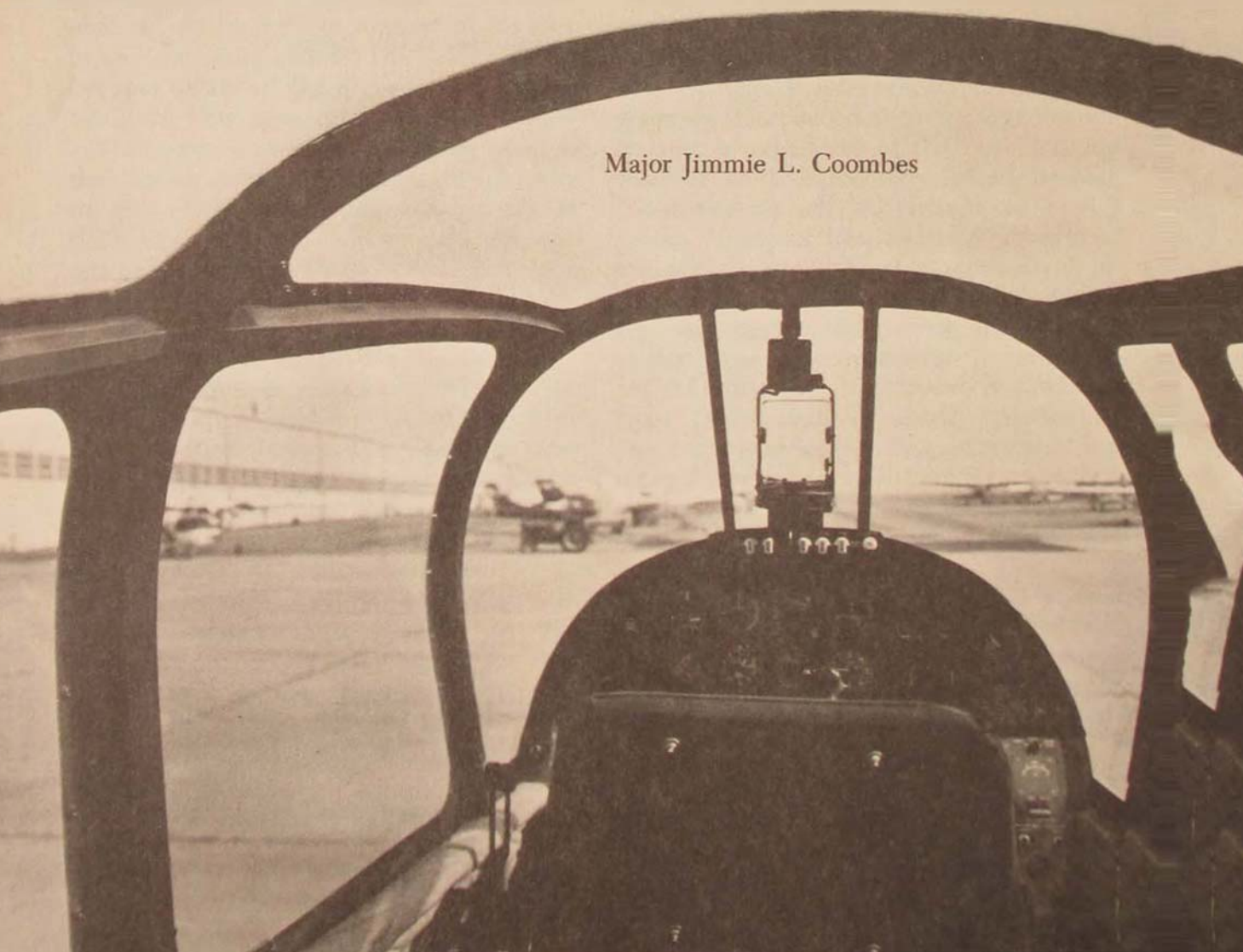
ERIC HOFFER



THE USAF INSTRUMENT FLIGHT CENTER

anachronism or instrument flight
pacesetter for the future?

Major Jimmie L. Coombes



THE circumstances that led to the founding of the USAF Instrument Pilot Instructor School in March 1943 were chillingly described twenty years later by one of the officers responsible for founding the school, Colonel J. B. Duckworth:

I realize that most of you were not around when this school was started at Bryan in early 1943, and it may be difficult for you to realize the urgency, and in fact, the tragedy of the situation at that time . . . hundreds of Cadets . . . had completed flight training without ever having been given one hour of instruments. What happened? They were immediately sent off to fly a B-26 across the Atlantic at night where, of course, it was black as the inside of a cow! . . . we were losing far more pilots on instruments than from actual combat.¹

That school formed the foundation upon which the USAF Instrument Flight Center was established in May 1972; it remains one of three divisions in the center.

Until World War II, the haphazard way of acquiring and using aircraft instruments had resulted in general flying training's far outpacing instrument training. This, coupled with the fact that the air war in 1943 was conducted almost exclusively during visual flight conditions, resulted in a 27-week pilot training syllabus with only rudimentary instrument instruction—primarily the “needle-ball-air-speed” method at that!² These shortcomings, which seem so obvious in the cold light of hindsight, led Colonel Duckworth and four other officers to devise an innovative full-panel system for attitude instrument flying. They ran highly successful field tests of the new system and developed a curriculum for the Instrument Pilot Instructor School (IPIS), which was subsequently established at Bryan Field, Texas, in March 1943.

Throughout the thirty-year history of the IPIS, its mission has remained essentially unchanged; in fact, in expanded form it has become the mission of the USAF Instrument Flight Center (IFC) today: training

instrument flight instructors in sufficient numbers to meet the needs of the Air Force; providing standardization in the use of instrument procedures, techniques, and training methods; and participating in the test and evaluation of flight instruments and instrument systems. This mission, though questioned, has seldom been seriously challenged in those thirty years. In the beginning it was a recognized fact that many pilots were killing themselves and destroying aircraft because of inadequate training in instrument flying. Since that time, instrument displays have progressed from crude needle-ball-air-speed presentations to the elaborate autopilot-coupled flight-director systems of today, and instrument flying has progressed from almost none to fully automatic all-weather landing systems. With such a rapid technological pace, the need for an instrument school, with its corollary standardization and research and development functions, seemed manifest.

But in the seventies, spectres have begun to rear their heads: “cost effectiveness . . . mission essential . . . program cutbacks . . . force reductions.” Planners have been forced to look carefully at Air Force programs at all levels, and from this scrutiny one question has arisen: “Is the IFC an anachronism?” Many pilots feel that it is. After all, they say, Undergraduate Pilot Training is no longer a 27-week course in contact (visual) flying; it is a 52-week course, with extensive academic requirements and 210 hours of jet flying time, approximately 20 percent of which is *instrument* training. The graduate of Air Force pilot training today is a well-qualified instrument pilot. The major air commands have established, or are in the process of establishing, their own central instructor schools that will perform all the functions of the IPIS. Because of these and other arguments, there are many who feel that the IFC/IPIS is outdated and no longer needed. Suggestions for its disposition range

from eliminating the IFC altogether through eliminating the IPIS to conducting an all-simulator (no flying) IPIS. And why not?

To answer these questions, they must be examined in detail.

eliminate the IFC

Unlike nuclear or tactical weapons delivery, aerial refueling, or hurricane penetration, instrument flying is not exclusive to one major command or one mission. Only one aircraft type (or command) may ever be called upon to land on the Arctic ice pack, but every pilot in every aircraft in the USAF is continually required to engage in instrument flight. Because of the rapid proliferation of instrument flight operations worldwide and the ever present need for safety, these instrument flight operations *must* be standardized. Equally important, the "new technology" of the sixties and seventies has resulted in a multitude of new and innovative instrument systems that must be tested and evaluated; engineers' dreams for the future are boundless.

The civilian aviation community has built-in mechanisms to ensure that the capability for instrument flight remains abreast of developments. First, the Flight Standards section of the Federal Aviation Administration maintains general standardization of all procedures relevant to instrument flying and ensures the application of these standards through its dissemination and monitoring (flight check) functions. The corporation profit motive, applied to both equipment manufacturers and civil air carrier users, guarantees that equipment appropriate to needs, actual or anticipated, is designed, developed, tested, certified, and utilized.

What of USAF? Where are the mechanisms to ensure that military pilots remain abreast of innovations in equipment, systems, and procedures? At present these responsibilities are vested in the Flight Standards Division

and Research and Development Division of the Instrument Flight Center. These divisions are tasked to

. . . prepare and monitor Air Force directives and publications governing instrument flight, determine USAF operational requirements for flight information, develop, coordinate, validate, and test instrument flight requirements, concepts, techniques, and procedures, . . . and participate in research and development programs involving instrument flight. . . .

The language of the regulation is dry, but the charter is clear: these absolutely essential functions are being performed by the IFC, and the USAF cannot afford to be without them. Who would administer the fledgling research study of the Microwave Landing System (MLS) pilot factors? Who would complete the Helicopter Pilot Factors study, the first of its kind in the world, that the Research and Development Division is conducting? Who would complete such projects as the Landing Weather Minimums investigation, hailed by many as the most significant advancement in all-weather landing research ever achieved by the Air Force? The list is extensive.

The mandate is clear. The programs and requirements are essential. The Air Force cannot afford to eliminate the Instrument Flight Center.

eliminate the IPIS

. . . but maintain flight standards and research and development.

The thrust of the argument in support of this suggestion is that the major air command central instructor schools will offer identical instruction to that provided at IPIS (whether or not IPIS remains in operation), and therefore the \$12,000 per graduate cost of IPIS is not cost effective.³ The point is well taken. Suppose the central instructor schools *do*, indeed, offer identical instruction (from an effectiveness point of

view) and the standardization that is essential in this nonparochial area can be maintained, perhaps IPIS would not be cost effective. There are several problems inherent in the basic supposition, however.

There is absolutely no requirement for a central school to expose an IPIS graduate who has been selected for instructor pilot upgrade in a particular aircraft to the same training that a non-IPIS graduate will receive. In the area of instruments and instrument flying his training requirement would certainly be minimal. If flying sorties in aircraft such as the C-5 and B-52 could thereby be saved, the cost effectiveness of the IPIS graduate begins to increase markedly. Additionally, what more logical pilot is there to be charged with developing and operating the instrument portion of a central instructor school? The IPIS graduate is ideally prepared and suited for this role. One extremely important corollary to the use of IPIS graduates in this manner is standardization—if the major air commands operate their own schools according to their mission requirements, as they should, there is a very real danger that, over a period of years, the Air Force-wide standardization that is essential in the area of instrument flight would be diluted to an unacceptable degree. The continuing input of IPIS graduates into the faculties of these schools would ensure that all commands were standardized with each other, the Federal Aviation Administration, and civil aviation in general.

Another consideration that deserves mention is "inbreeding." After a period of time, it is assumed that the faculties of the central schools would all be not only products of their own schools but also long-time products of their own commands (because of "longevity" requirements for instructor pilot upgrade). This kind of multiple inbreeding could eventually result in an ideastified atmosphere. Civilian education institutions have long realized the inherent

dangers of such a situation and have attempted to avoid it.⁴ A regular infusion of IPIS graduates into the faculties of those schools would ensure a continuing fresh and informed approach to the teaching of instrument-related subjects.

Is not the IPIS itself a product of inbreeding? In a very limited way, perhaps, it is, since all IPIS instructors are IPIS graduates. The permanent change of station (PCS) inputs to IPIS, however, are from all commands and represent a broad cross section of experience levels. The students who attend the school have equally dissimilar backgrounds, and these two factors prevent any stagnation in the IPIS approach to instrument instruction.

The Instrument Flight Center operates on a concept of synergism—the whole is greater than the sum of its parts. This is true to a very large extent because the IPIS, through its instructors *and its students*, represents a source of operational input to both the Flight Standards and Research and Development Divisions. If there were no IPIS, these essential functions would be performed in a semivacuum, devoid of operational inputs on a face-to-face level, and the effectiveness of both would suffer from a severe loss of credibility among Air Force pilots. According to General Momyer: "I have had much confidence in the teaching and standardization of instrument flying techniques that have come out of IPIS over the years. . . . As a consequence of their first-hand experience, the IPIS provides a very needed service to the Air Force."⁵

Now back to that most important business of cost effectiveness. It is very tempting to make statements like "As a result of the efforts of IPIS, X number of instrument-related accidents have been prevented, saving Y millions of dollars." As tempting as it is to say, however, it simply cannot be proven. But it is a fact that increased instrument expertise in the Air Force can decrease

the probabilities of instrument-related accidents, and the IPIS is an available source of such expertise.

The need for increased experience in the field of instrument flying is substantiated by the fact that our rated force experience level is rapidly declining and will even be lower in the post-1973 time period. . . . The cost of this increase is relatively small if we can prevent the loss of *one* aircraft and crew.⁶

*an IPIS conducted with
simulators (no aircraft)*

This proposal has the greatest appeal to those who would alter the present IFC con-

cept because it appears to offer, at the same time, a great cost saving in the elimination of the expense of flying while not degrading the effectiveness of the IPIS in providing the Air Force with fully qualified instrument instructor pilots. But does it, indeed, provide the "fully qualified" instructor that the Air Force needs?

A great deal of research has been done, and is in fact being done, in the area of flight simulators. Much of this research indicates that, with proper planning and correctly designed simulators, present flying training syllabi can be radically redesigned with greater emphasis on the use of simulators and correspondingly lesser emphasis

*L-5 to C-5—thirty years of advancement in
aircraft instruments and instrument displays*

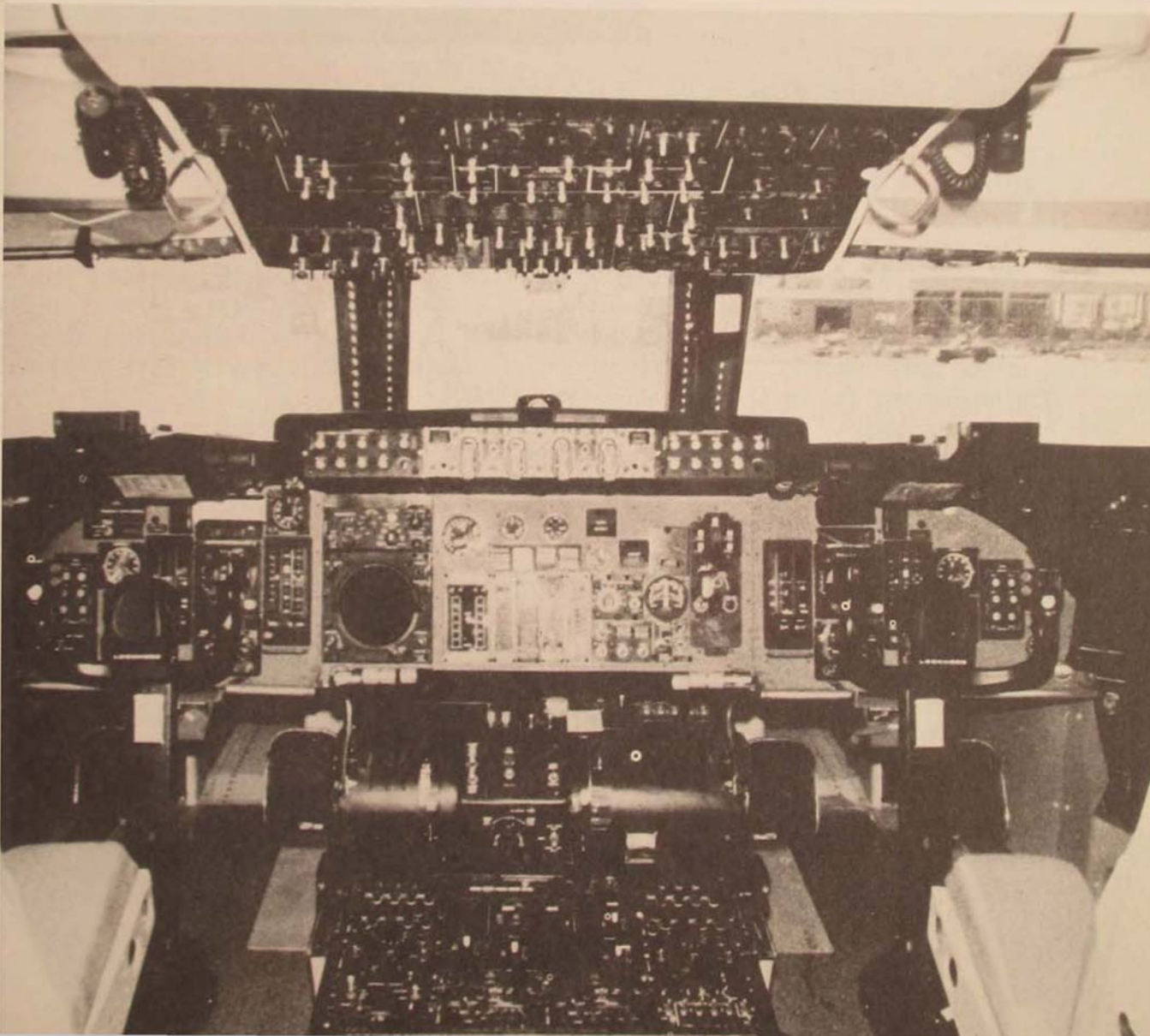


on actual aircraft flying.^{7,8} There has been no controlled research, however, claiming that flying training in the actual aircraft can be completely replaced by simulators. In fact, the transfer and validation of simulator training require far more research before we can know for certain exactly how much of any given flying syllabus can be replaced by simulators.⁹

Because of these research gaps, most learning and engineering psychologists consistently include in their discussions of simulators and training the understanding that all such training should be validated in an actual operational environment in an aircraft.

When [a simulator] is employed for improving performance, . . . the characteristic of importance is the amount of transfer of learning to an operational task . . . the training effectiveness of a device is determined in terms of the measurement of transfer from training on the device to performance in an operational situation.¹⁰

The training of an individual to be an instructor pilot is similar in many ways to the basic training of someone to be a pilot—both involve the learning of a skill that must eventually be performed in an aircraft. Granted that, like all present flying training programs in the Air Force, IPIS can make greater use of simulators in its



Colonel Joseph B. Duckworth, founder of the Instrument Pilot Instructor School, quoted a high-ranking member of the Air Staff as saying: "Instrument flying is inherently dangerous and should not be taught to our pilots." This was in 1943 during deliberations on whether the school should be founded.



syllabus, available research indicates that actual flying cannot and should not be eliminated from the program.

The IFC and the IPIS should not be eliminated; the mission they perform is too vital to the overall mission of the Air Force. But to say this is not to say that the IFC can continue unchanged in a changing world. The mission will remain the same—service—but the methods of achieving the mission and goals must keep pace with escalating needs.

The Instrument Flight Pacesetter of the Seventies

If any single concept must attach itself to the Instrument Flight Center for the foreseeable future, it is the concept of responsiveness. If the IFC is to be a service to the worldwide operations of the Air Force, it absolutely must be responsive to the needs of operations throughout the Air Force. But responsiveness is a two-way street—if an organization is to provide a service to a using agency, the user must

indicate the nature of the service that is desired.

The IFC/IPIS has gone through several changes in form during its thirty-year history. It was originally an instrument flying training school, and it is now an instrument instructor school. The Flight Standards and Research and Development Divisions, now

The North American T-39 Sabreliner, backbone of the Landing Weather Minimums investigation. This project has been hailed by many as the most significant advancement in all-weather landing research ever achieved by the Air Force.



A T-39 approaching the Tactical Landing Approach Radar (TALAR) antenna. Investigation of pilot factors associated with advanced instrument technology is performed by R&D Division of the IFC.



collateral units with IPIS within the IFC, were once attachments to the IPIS. The syllabus no longer contains physical training, which was at one time a 25-hour unit of the course. Helicopter instrument training, absolutely essential in the present-day Air Force, is now an integral part of the program. And the list could go on and on. The point is that, while most of these changes were made as adjustments to the changing needs of the Air Force, in many cases the needs were interpreted by personnel within the center and not as direct responses to stated needs from the using agencies.

The required responsiveness is built into the center's organization. If the instrument procedures and techniques currently used need to be changed, the people who work here can change them. If the regulations are too binding, unrealistic, or hard to understand, the people who can rewrite them work here. If the flight instruments in use are inadequate, the people who can test and evaluate new equipment work here. If the instrument instructor pilot does not possess the skills he needs in the operational environment, the people who can change the skills he is taught work here. The centralization of all these functions ensures the needed responsiveness, but the users must tell the IFC what their changing needs are.

The communications channels among Hq USAF, USAF operational units, and the USAF IFC must be opened wide and strengthened. The IFC has initiated a broad spectrum of efforts designed to accomplish this from one end. The recently initiated Instructional System Development survey of IPIS was begun in order to make the IPIS syllabus coincide and to keep pace with the needs of the Air Force for instrument instructor pilots. As a result of task analysis statements obtained from this study, the entire IPIS syllabus is being realigned to the present needs of the Air Force. But do not forget the fantastic proliferation of instruments

and instrument procedures and techniques in the recent past. This expansion will certainly continue, and the needs of the Air Force today may change considerably by next year.

A briefing team whose purpose is to make interested parties aware of the uses to which the IFC can be put is in the planning stage. This team, to consist of instrument flight experts from within the IFC, will be on call to provide answers to instrument-related questions for Air Force operational units and to provide a face-to-face communications channel between these units and the IFC. A staff assistance team, chartered to provide assistance in the design and operation of instrument training facilities, is in the conceptual phase. Neither the briefing team nor the staff assistance team will be forced upon anyone. They will respond to requests from units who desire their assistance.

These are but a few of the efforts being made within the IFC to keep the communications channels with the field open. They will be effective in ensuring the responsiveness that is so necessary, but their total effectiveness will be much greater if efforts are being made at the other end. As an example, area navigation capability is very likely to become a requirement for all instrument flight operations in the near future, and the IFC Flight Standards Division will undoubtedly be called upon to assist in the drafting of procedures and regulations for its use. In addition, the Research and Development Division will be involved in pilot factors testing of proposed equipment. Finally, the IPIS will establish a requirement for teaching this new information in the school. All these steps can be taken with only minimal inputs from the field, but think how much more effective and efficient they will be if the operational commands make their needs known in advance. This is the way the IFC should, and can, function

if Air Force operational units make their requirements known.

Perhaps the most useful means of communications between the IFC and Air Force operational units is the IPIS graduate. He can be optimally effective, however, only if his talents are properly utilized. Although AFM 50-5 and AFR 53-12 both require that IPIS graduates be utilized in an instrument training capacity for one year from the date of completion of the school, it has been found that this resource is not always properly managed. A field survey in 1949 revealed that IPIS graduates were being only 55 percent utilized, and Headquarters USAF directed all commanders to monitor utilization more closely.¹¹ Essentially the same situation in 1959 resulted in another directive from the Flying Training Division at Headquarters USAF to all commanders. A follow-up field survey in 1962 showed proper utilization,¹² but the ISD survey in 1973 showed that utilization of graduates had, once again, become a problem area. In fact, the survey team found that in some cases commanders were not aware that they had IPIS graduates assigned to their units.¹³ This represents mismanagement of a valuable resource, a resource that could contribute greatly to the operational effectiveness of any unit.

The IPIS graduate is an expert—an expert

in the field of instruction, in general, and instrument flying, in particular. He can manage existing continuation training programs and design these programs where they do not exist. He is ideally suited to serve on the faculty of command instructor schools. He would be an outstanding asset to any standardization/evaluation section—and he is a point of contact: a communication channel to the IFC. He has been here at IFC and is more aware than anyone in the operational unit of the capabilities of the center.

Any organization that deals with fast-breaking technological changes must remain flexible and responsive if it is to accomplish its mission. It cannot afford a "head in the sand" attitude. But it cannot be viable if it operates in a vacuum either. The responsiveness and flexibility necessary to keep up with improvements and changes in the field of instrument flight are inherent in the mission and structure of the Instrument Flight Center. It can be the service agency for the United States Air Force that it was designed to be, but the operational units in the Air Force must be aware of the capabilities of the IFC, and they must tell the IFC what their needs are.

USAF Instrument Flight Center

Notes

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THE PEOPLE MIX

MAJOR JAMES M. ALFORD

IN a recent article in *Airman* magazine, General David C. Jones is quoted as saying, in part, about leadership styles: “. . . develop a style of your own in working with others that is based upon motivation, sensitivity and common sense.”¹ The Air Force manager who would develop such a leadership style needs to understand what motivates people, to be sensitive to these factors, and to recognize the differences in the individuals with whom he works.

In studies of the behavioral sciences as applied to management and leadership, the Air Force supervisor becomes familiar with concepts such as the late Douglas McGregor's Theory X and Theory Y approach to managing people: i.e., people are lazy and must be prodded and coerced to produce (Theory X), or people find work to be as natural as play and will work diligently if provided an opportunity (Theory Y).² Frederick Herzberg, in his studies, found that people either tend to be motivation seekers, who wish to excel for the sake of achievement and growth and are willing to take some risks in order

to excel, or else they tend to be maintenance seekers, who are more concerned with a safe and secure job and are less willing to take risks than is the motivation seeker.³

Many other theories of motivation and leadership activities are advanced in the myriad of publications in this area. Some are merely an extension of an earlier concept. The degree of usefulness of such theories to the supervisor varies with the supervisor's background and ability to correlate the data presented. However, almost all fail to provide the manager/supervisor with what he really needs. That is, how does it all fit together? How does he know which theory to consciously apply? The answer lies in the old saying, “Know your people.”

Alvin W. Gouldner provided a way to do this when he developed his models of employees by classifying them as either “cosmopolitans,” that is, people oriented toward their professional skill, or “locals” those oriented toward the organization.⁴

Gouldner lists the characteristics of his two categories of people:

Cosmopolitans	Locals
1. Identify themselves more strongly with professional and functional specialty	1. Identify themselves strongly with the employing organization
2. More likely to be mobile	2. Career oriented with one firm
3. More concerned about their specialized skill or functional area	3. Committed and dedicated to the organization as an entity
4. Little concerned with internal details or politics unless they are inhibiting	4. More involved in and concerned about internal details and politics
5. Seek recognition beyond the company boundaries, i.e., (from peers in other organizations, etc.)	5. Rely on getting recognition within the organization
6. Less tolerant and more vocal about job climate problems	6. More tolerant of and less vocal about job climate problems
7. Tend to have few—and relatively loose—ties with people in the organization	7. Develop closer and more extensive relationships with people in the organization
8. Have less influence because of less involvement	8. Tend to have more influence

It is important that Air Force managers understand this concept. Talks with young officers indicate that we have moved away from an officer corps composed almost totally of "locals" toward one with a considerable percentage of "cosmopolitans." This appears more evident among the young nonrated officers than among the rated officers. This is primarily because of

the various professional specialties found in the nonrated areas, such as research scientists and engineers, personnel officers, instructors in technical areas, and other staff positions. The staff positions demand a type of specialized knowledge, skill, education, or experience which relates specifically to the professional area of the individual job.

The Air Force encourages professional development by providing an abundance of opportunities for the young officer to participate in education and training related to specific professional areas through the Air Force Institute of Technology and other training activities. The officer is usually surrounded by civilian professionals during these programs. It is natural for him to gravitate toward these professional people and their professional organizations.

A recent survey by *Business Week* magazine revealed the following about 1965–1972 college graduates and their relationships with employers:⁵

1. Employers describe them as brilliant, hard-working, and imaginative.

2. The graduates:

a. Value money for different purposes than their predecessors (camping gear rather than posh furniture) but value it just as much.

b. Value security so little that some companies no longer mention pension plans during recruitment.

c. Prefer to work for "socially responsible" companies. They will not leave otherwise desirable jobs but will channel ethical impulses into after-hours projects.

d. Differ in their reactions to the business world. Liberal arts graduates are often happier than business school graduates. Liberal arts graduates expect business to be dull and are happy to find that companies can be human and responsive. Business school graduates are prepared wholly

for rational business methods and recoil from decisions made on subjective grounds and promotion through favoritism.

3. The young graduates are independent, creative, willing to take risks and to stand on principle. They become unhappy when the organization stifles or does not adequately recognize their ability and accomplishments. They are very mobile and do not hesitate to change jobs when they are not provided with challenge and opportunity for advancement.

It is these qualities of young people that make them desirable officers and that also can create headaches and misunderstanding between more senior officers and themselves. As an officer matures, he tends to accept policy and directives without questioning them as do the younger officers. Also, officers who spend most of their career in operational positions, where mission requirements cause close adherence to checklists or routine procedures, find themselves unaccustomed to the cosmopolitan leanings of the young officers they supervise when they receive career-broadening assignments. Further, in this period

of trying to operate more effectively with less money and fewer people, our current personnel reduction programs tend to make the young officer unsure of the course he should pursue.

We must be alert and understand the contributions that can be made by cosmopolitans. Do not rush to the conclusion that the young professional scientist, engineer, or staff officer will not become one of our better officers because he talks in terms of his specialty rather than of the Air Force.

The cosmopolitan tends to provide competition to the local, which can improve the local's performance, and at the same time the local and his "company" orientation can help the cosmopolitan better appreciate that the "company" goals and his own can mesh.

A healthy mix of cosmopolitans and locals is needed to insure a strong, effective, and innovative Air Force. The challenge to the Air Force manager is to recognize the potential in such a mix and provide the atmosphere in which both types can be productive.

AFROTC Det 765, The Citadel

Notes

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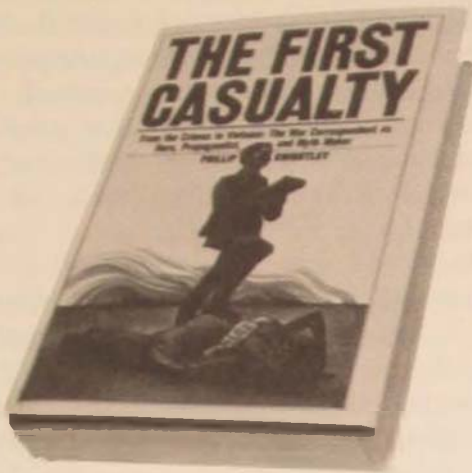
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R books and ideas



TRUTH IN JEOPARDY

COLONEL DON CLELLAND

THE title of Phillip Knightley's recent book, *The First Casualty*,[†] comes from Senator Hiram Johnson's 1917 remark: "The first casualty when war comes is truth." Frankly, benumbed as they are by the Watergate-CIA-FBI revelations, many Americans may feel that war is being unfairly singled out here. On almost a daily basis, our citizens are now discovering how

variable an entity truth is and how useless sophistry is in defending its variations.

As Mr. Knightley convincingly shows, the United States is not alone in its wartime censorship, with its denials and distortions of the truth. It is probably accurate to say that all nations share this culpability to some degree. Yet this knowledge offers Americans no real comfort. Judgments made concerning national ethics seem indissolubly tied to the ethical contract between the citizen and the state. Here in the United States that contract finds major support in the first ten amendments to the Constitution. The first of these guarantees the freedom of the press. And that guarantee stands apart, without any blanket wartime proviso which would nullify that freedom in the presence of "national security" or cause it to self-destruct at the sound of hostile fire. Nor is there anything likely to be found in related writings that obligates the press in wartime to roll over and await instructions at the first solemn whisper of "national security."

Not that passivity is a particular characteristic of war correspondents. Being composites, like the rest of us in other professions, they are active and lazy, liberal and conservative, reactionary and innovative, bold and cowardly. They also are inspired by patriotism and hemmed in by the restrictions of centralized communications and the constant threat of expulsion from the war zone. Yet, all that said, one reads *The First Casualty* and comes away with an ill-defined feeling that these unique men did not fight fiercely enough against the censorship of their efforts to bring the truth to the people.

Sometimes surprisingly quick to subordinate the role of the press to the role of the government in wartime, the cor-

[†] Phillip Knightley, *The First Casualty* (New York: Harcourt Brace Jovanovich, 1975, \$12.95), 465 pages.

respondents might all recall with profit Jefferson's remarks about the press: ". . . and were it left to me to decide whether we should have a government without newspapers, or newspapers without a government, I should not hesitate a moment to prefer the latter."

Knightley cites Lloyd George, Prime Minister of Great Britain, in what seems to be a flagrant abdication of responsibility, as saying in 1917 about World War I: "If people really knew, [this] war would be stopped tomorrow. But of course, they don't know and can't know. The correspondents don't write and the censorship would not pass the truth." What exactly it is that the people ". . . don't know and can't know" is not spelled out. Retrospectively, however, one can speculate that it might have been the political mindlessness after Sarajevo that found one nation after another following almost blindly and stumbling into the abyss of World War I; or it might have been an exposure of the arid military imaginations on both sides of the conflict—imagination strategically and tactically so inflexible that they would literally cripple an entire European generation.

As we know, the propagandists of the West were exceptionally successful in World War I—the people were not allowed to *know*—and the war continued for more than a year following the above-quoted remarks of Lloyd George. Today's world *may* be better off through the resultant delay of the eventual armistice; perhaps faithful adherence to "national security" did serve mankind well. The answer to this should probably be left to historians, political scientists, and governmental leaders. The layman, though, can speculate that the pressures of a war-weary, enlightened electorate might have produced better results than what did occur. The layman can also legitimately puzzle over

the *Catch-22* nature of wars fought to "make the world safe for democracy" that at the same time deny the democracy the chance to talk about fighting, safety, or democracy.

Himself a correspondent, Mr. Knightley writes with skill and insight about the wonders and the warts of the fourth estate. He writes with sensitivity about many of the moral questions reporters must deal with; about those reporters who regard war as fun; and about those who eventually stagger away disillusioned by the inhumanity of man. He has Drew Middleton of the *New York Times* noting that a correspondent's basic responsibility is ". . . to get the facts and write them with his interpretation of what they mean to the war. . . ." And he presents an alternative approach by citing Herb Matthews: "I would always opt for open, honest bias. A newspaperman should work with his heart as well as his mind."

Somehow, though, these stark statements of philosophy do not seem adequate. What does it matter if Middleton is correct, or Matthews, if the essence of what they are writing does not get to the reader because of censorship? Perhaps the memory of Watergate and the *Washington Post's* Woodward and Bernstein is still too vivid to accept reportorial diligence that does not focus with equal intensity on the twin goals of getting the story and getting it to the public. And perhaps the refusal of the publishers of the *New York Times* to knuckle under to an irritated JFK and withdraw David Halberstam from Vietnam is still too recent a reminder that neither patriotic reporters nor patriotic publishers need give in automatically to governmental pressures.

None of this is meant to suggest that *The First Casualty* doesn't treat the issue of governmental censorship. It does, and well. However, the book also discusses

reporters from many countries involved in many wars. Accordingly, it is likely to cause exclusively national issues to flare up—issues that were placed on the back burner during hostilities but which need to be discussed in a time of postwar calm.

Certainly, this is a “big” book. It sweeps across the landscape of Western war from Crimea to Vietnam at a pace swift enough to sustain interest but not so rapidly that events are fragmented beyond recognition.

It has a cast of thousands, and its main characters—the Burchetts, the Murrows, the Pyles, the Halberstams, *et al.*—have been household names. It is easy reading and caters to appetites as diverse as adventure, history, and war. In his devotion to “the whole truth,” the author will shock the average reader in at least one passage: “The Americans mutilated bodies. One wants the hearts cut out of the dead Vietcong to feed his dog . . . skulls were a favorite, and [one well-known colonel] carried one about at his farewell party.”

The student of history will find *The First Casualty* a valuable adjunct to his text, since it adds to the dimension of viewpoint. The evacuation of Dunkirk, for example, has assumed almost mythical status in some circles. Here the author has General Sir Harold E. Franklyn, a division commander at Dunkirk, saying “. . . that the evacuation has been over-glamourized and that reports of merciless bombing and the hell of Dunkirk were quite ridiculous.” In the same spirit Liddell Hart points out

that “. . . the German breakthrough that led up to Dunkirk . . . was actually achieved with armies inferior in numbers to those opposing them. . . .”

The First Casualty also has a nice touch in debunking legends. Hemingway would be furious were he able to read Knightley’s assessment of his reportorial performance in Civil War Spain:

. . . his performance as a war correspondent was abysmally bad. On a technical level, his descriptions of battle and bombardments are monotonous; his emphasis on his own close location to the action smacks of boastfulness; his accounts of blood, wounds, and severed legs are typical of his desire to shock. . . .

There are numerous bonuses like this throughout the book. They spice it up and make it swifter reading. But they hardly constitute the most memorable element of *The First Casualty*. That consists, instead, in the reminder the book provides that the fight for individual freedom need not be an international fight, or even one against an avowed enemy, and that the best ally the citizen can have is a free press possessing the will to fight for that freedom. As to whether we Americans should get the unfiltered truth or that which drips down slowly and erratically through the bureaucracy, Patrick Henry’s confident remark has a wonderfully fundamental sound: “For my part, whatever anguish of spirit it may cost, I am willing to know the whole truth, to know the worst, and to provide for it.”

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SOVIET MILITARY THEORY IN ENGLISH

the language barrier hurdled

DR. KENNETH R. WHITING

A review of Harriet Fast Scott's new edition of Sokolovsky's *Soviet Military Strategy* and of William F. Scott's *Soviet Sources of Military Doctrine and Strategy*.

UNTIL 1963 the study of Soviet military doctrine and strategy was an arcane area limited to those who read Russian. The literature in English dealing with the topic was *about* Soviet military thinking, i.e., how the American or British writer interpreted the Soviet thinker he was dealing with at the time. Then in 1962 came the Sokolovsky classic on military strategy and translations of that work in 1963, thus opening up Soviet military thinking to those who did not read Russian.¹ Since then English translations of Soviet books and articles on military topics have proliferated, and the inability to read Russian is no longer a valid excuse for ignorance about Soviet military thought.

A revised edition of Sokolovsky's *Military Strategy* was published in 1963 and another revision in 1968. It is still the classic work on the subject and is recommended reading for Soviet officers right down to the present time. And now we have a new English version edited and analyzed by Mrs. Harriet Fast Scott.† Mrs. Scott combines all three editions in one volume, with mar-

ginal symbols to indicate the various editions. Furthermore, in her notes she points out and reproduces the passages excised in later editions. She also puts the book in perspective in a twenty-page introduction and precedes each chapter with a brief analysis. All in all, the ghost of the late Marshal Sokolovsky would be very ungal-lant indeed to complain about the elaborate treatment that Mrs. Scott has accorded his book.

Military Strategy was written by fifteen military theorists, mostly generals and colonels, who worked under the overall direction of the late Marshal Sokolovsky, Chief of the General Staff between 1955 and 1960. The work represents the first full-dress exposition of Soviet military strategy since the publication of Svechin's *Strategiya* in 1926.

THE authors, in the first chapter of their book, go into great detail in describing just what "strategy" is and how it dovetails into "operational art" one

† V. D. Sokolovsky, Marshal of the Soviet Union, editor, *Soviet Military Strategy*, edited, with an analysis and commentary, by Harriet Fast Scott (New York: Crane, Russak & Company, Inc., 1975, \$17.50), 494 pages.

echelon below and into "military doctrine" one echelon higher. As they point out, the Soviet use of the word "strategy" is equivalent to the term "grand strategy" in Western parlance. They also admit, in contrast to earlier Soviet theorists, that the "laws of strategy are objective and apply impartially to both hostile sides." (p. 9) They go on to point out that the development of weapons technology has considerably influenced the nature of war and military strategy.

The appearance of the nuclear rocket weapon radically changed previous concepts of the nature of war. Modern nuclear rocket war in its destructive and death-dealing potential cannot be compared with previous wars. Mass application of nuclear rocket weapons makes it possible within a very short time to force a country from the war, or a number of countries, even those with relatively large territories, well-developed economies, and populations on the order of tens of millions.

There is an immeasurable increase in the spatial scope of modern war. The almost unlimited range of the means of delivery of nuclear weapons gives modern war such an infinite scope that the boundaries between the front lines and the rear areas are erased, eliminating the previous concept of the theater of military operation. (p. 11)

The revolution in strategy has made it necessary to revise a whole series of previously accepted principles, such as the concentration of forces and weapons in decisive areas, less reliance on "potential capabilities" because of the great importance of the initial period of the war, and the idea of gaining victory through a series of partial victories. Furthermore, such a basic element of strategy as the "theater of military operations" has changed completely: strategic bombers and long-range missiles have wiped out the old concept. Theaters are now whole continents, vast regions of the atmosphere, and the endless reaches of space.

The rest of the chapter is devoted to a somewhat shrill exposition of the eternal verity of the Marxist-Leninist ideological underpinnings for a correct military strategy. They maintain that, in spite of rumors to the contrary, the essential nature of war as a continuation of politics in a more violent form does not change with developments in technology and armament. Kingston-McCloughery's dictum that nuclear warfare will result in mutual annihilation and thus put an end to all politics is cited as an example of bourgeois propaganda, although the authors fail to explain how politics continue once mutual annihilation has ensued. Actually, they assert, state policy determines not only the strategic aims but also the general nature of strategy. For example, imperialism is an outmoded social system, and thus its strategy is adventurist and ignores the laws of armed conflict, the role of the popular masses, etc. Imperialism cannot have a viable strategy, and thus the present theories of "limited war," "massive retaliation," and "global war" advanced in such profusion by bourgeois military theorists.

IN Chapter 2, entitled "Military Strategy of Imperialist Countries and Their Preparation of New Wars," the Sokolovsky team describes and analyzes imperialist strategy, especially the American variety; at least they describe their version of imperialist strategy.

The first section deals with "Contemporary Military Strategy of the U.S.A. and NATO." Following the defeat of Germany and Japan, Britain, France, and other European countries that had been occupied by Germany were in bad economic straits. But the U.S. had reaped unbelievable profits from the war and used its position to strengthen its economic, political, and military positions.

The political aims of the American imperialists were and are to enslave economically and politically the European and other capitalist countries and, having turned them into obedient instruments, to unite them into various military and political blocs and groups aimed against the countries of the socialist camp. All this follows the main goal: the achievement of world domination. (p. 52)

In the early postwar years the military and foreign policy of the United States was to surround the socialist camp with military and political blocs in a simple anti-Communist coalition. Then came the "expansionist" policy, exemplified in the Truman Doctrine, the Marshall Plan, and the Eisenhower Doctrine. Shortly thereafter came NATO (1949), SEATO (1954), and CENTO (1955), plus pacts with "vassal" states such as Japan, South Korea, and the Kuomintang clique. The appearance of nuclear weapons facilitated the formation of a single imperialist military policy dictated by the Americans, an integral part of which was the concept of dealing "from a position of strength" toward the Soviet Union.

Between 1954 and late 1960 the U.S. held to the strategy of "massive retaliation," but the imperialists were "in reality preparing for a surprise nuclear attack against the Soviet Union and the other countries of the socialist camp." (p. 54) But Soviet achievements in nuclear weapons, missiles, and exploration of space revealed the concept of "massive retaliation" to be unrealistic. The tremendous increase in the number of nuclear weapons and missiles and the incredible danger involved in their use led to an American-NATO re-evaluation and the concept of "mutual deterrence." The inflexibility of "massive retaliation" also resulted in the idea of "flexible response," a concept which makes "it possible, if necessary, to conduct either a general nuclear war or a limited war with or without the use of tactical nuclear

weapons." (p. 57) This theory was formulated by General Maxwell Taylor in his book *The Uncertain Trumpet* and subsequently adopted by the Kennedy administration. In 1962 Defense Secretary Robert McNamara came up with the "counterforce" strategy, which posits the main task as the destruction of the enemy's armed forces, not attacks on the civilian population. The illusory nature of the "counterforce" strategy is only too obvious: "If nuclear war is unleashed by the militarists, then no strategy, however it may be called, will save imperialism from destruction." (p. 59) "The strategy of 'counterforce' primarily stems from the necessity for preventive war and the achievement of surprise." (p. 61) Then there was the concept of "guaranteed destruction," dating from 1965, which calls for the American capability to destroy a potential enemy even after a well-planned attack by him. McNamara accompanied this strategy with his "damage limiting" concept whereby strikes against the enemy's nuclear means of attack, plus passive defense measures to protect the civilian population, limit the destruction in a general nuclear war.

Our soldier-scholars then devote some six pages to a discussion of "limited war." (This discussion is an addition to the third edition.) Although they explore the concept in some depth and quote copiously from American authorities, their attitude is somewhat ambiguous; in their opening paragraph they say:

The concept of a limited war is an adventurous calculation of the U.S. imperialist circles for conducting war on foreign territories; it is a concept for assuring the safety of the U.S. by excluding their territory from the possible zone of limited warfare; and finally, it is one of the methods of preparing an unlimited nuclear war against the Soviet Union and the socialist countries. (p. 64)

But as they go more deeply into the subject, their attitude is less dogmatic. They acknowledge that little is known about how the use of tactical nuclear weapons may affect the course of a limited war and go on to quote Kissinger's dictum (*Foreign Affairs*, July 1962) that "limited nuclear war will automatically escalate into a general war because the losing side will continually commit new resources in order to restore the situation." (p. 68)

The authors (writing before the Bonn-Moscow agreements of 1970, of course) really take out after the West German "revanchists":

It is a reflection of the revanchist policy of the West German imperialists, those maniacs of particular variety, who, in spite of the complete defeat in two world wars, continue pedantically, openly, and secretly, to plan, and methodically and persistently to create, an extensive system of political, economic, military, and psychological measures in preparation for a new war. (p. 70)

The rest of the chapter is devoted to a description of the American and NATO forces and their economic preparations for war. On the whole, the factual data for the second half of the 1960s are accurate enough, but the interpretation is permeated with "imperialist" subterfuges and the *idée fixe* of a surprise attack on the Soviet Union and the rest of the socialist bloc.

Chapter 3 is a lengthy description of the evolution of Soviet military strategy between 1917 and 1945, which may be of interest to the historian but neither breaks any new ground nor reveals any startlingly new data.

CHAPTER 4, entitled "Nature of Modern War," gets to the heart of the matter. The authors again emphasize the Clausewitzian dictum of war as a con-

tinuation of politics by more violent means and assert that all the attempts of the imperialists and heretical Marxists to change that truth will avail nothing. Modern historical development is nothing other than a conflict between imperialism and socialism [i.e., Communism—KRW], with socialism now the stronger of the two. It is this strength of socialism that makes the policy of "peaceful coexistence between states with different social systems" possible. At the present time, however, there is a real danger that a world war may be unleashed by an imperialist attack on the Soviet Union and other countries of the socialist camp:

But an evaluation of the military-strategic situation of both camps as a whole is that the position of the socialist camp is considerably more advantageous and will ensure victory in the case of imperialist aggression. "Such powerful, invincible forces now oppose the aggressors that if they unleash war, then they will get nothing except their own destruction"—such was the conclusion made in the Report of the Central Committee to the XXIII Congress CPSU. (p. 187)

According to the authors, a new world war would be one between great coalitions, socialist and capitalist, and would be fought to the bitter end. It would involve tremendous numbers of people and embrace enormous geographical areas. It would be a nuclear-missile war, and the qualitative changes in the weapon systems involved would affect strategy—for instance, give immense importance to the initial period of the war. The authors, at this point, view with pride the *size of the Soviet warheads* and see them as a real advantage if a nuclear war were unleashed.

After all these apocalyptic forebodings about the inevitability of any new major war being a nuclear-missile conflict, the authors fall back on the old refrain of Soviet military theory:

. . . no matter how important the role of such means of strategy as Strategic Rocket Troops and rocket-carrying submarines may be in a future war, victory over the aggressor can be achieved only by the combined efforts of all means of waging war: Ground Troops, National *rho* Troops, Air Forces, and the Navy as a whole with the active participation of the people. (p. 198)

They then describe the various services and their roles in any future general war and come to the conclusion that "final victory will be attained only as a result of the mutual efforts of all services of the Armed Forces." (p. 210)

In summary, a third world war will be a nuclear-missile war in which "entire countries will be wiped off the face of the earth," "the war will acquire an unprecedented spatial scope," and "the initial period of the war will be of decisive importance for the outcome of the entire war." (p. 210)

CHAPTER 5, entitled "Problems of Organization of Armed Forces," is devoted to describing the tasks allotted to the various branches of the armed forces. Although it is taken as axiomatic that the nuclear missile is the basic weapon and that it determines how the armed forces are organized and how a future war will be waged, nevertheless the conventional weapons and services are extolled, as can be seen from the following excerpts:

It is well known that nuclear weapons have terrible devastating might and destructive power, that they are able, with one blow, to erase from the face of the earth entire countries with small territories. Enormous damage can also be done in large countries, especially when massive nuclear strikes are made against the most densely populated industrial regions. However, in order to completely defeat an enemy it is necessary to eliminate his ability to resist,

to destroy his means of nuclear attack and to eliminate his naval bases. These problems can be solved only by complete defeat of the enemy's armed forces and by seizure of his territories.

It is not possible to accomplish all these tasks with nuclear weapons alone. Other types of weapons will also be needed, as well as different kinds of fighting equipment. In particular, in a future war one may expect the employment of chemical and bacteriological weapons the development of which is being given great attention in the Western countries, especially the United States. (p. 243)

The advent of nuclear rocket weapons and the development of aviation and other means of armed conflict have, as we have already indicated, again brought to life the notorious theory of the possibility of waging war by small but technically well-equipped armies. The advocates of such theories fail to consider that the new weapons and the new military equipment, far from reducing the requirements of the armed forces for personnel, increases them both in respect to combat personnel and in respect to support personnel. The necessity of massive armies is also occasioned by the fact that large simultaneous losses from nuclear blows require considerable reserves for the reinforcement of the troops and the restoration of their combat capacity. Furthermore, the increase in the geographic extent of the war and the creation by nuclear blows of enormous zones of destruction and radioactive contamination require a large number of troops for the defense and protection of national borders, rear targets and communications, and for the liquidation of the consequences of the atomic blows delivered by the enemy. Therefore, there can be no doubt about the fact that a future war will be waged by massive multimillion-man armed forces. (pp. 244-45)

In their view, large ground forces are still necessary, but will have to move with great speed, largely in armored personnel carriers. Airborne troops will be used

mainly to capture, hold, or destroy missile, air, or naval bases deep in the enemy's territory. PVO (antiaircraft defense) will have the job of fending off nuclear air strikes on the ground forces, which, the authors admit, will be no small problem, given the sophistication of modern offensive weapon systems. Although the bomber has yielded first place to the missile, nevertheless both will be used simultaneously in a future war. Actually, some specific missions, such as hitting mobile targets, can best be accomplished by bombers. The air force as a whole (fighters, fighter-bombers, strategic bombers, and transports) is still a very necessary part of the modern armed forces.

CHAPTER 6 is concerned with the "methods of conducting warfare," which the authors define as "the aggregate of the procedures for waging military operations." (p. 260) The term includes the methods of using the armed forces as a whole and the utilization of the individual services.

In a 15-page minihistory of the development of the methods of conducting warfare since Napoleon, which provides the authors an opportunity to point up the insignificance of the American-British contribution in World War II,^o they point out the quantum leap in the development of methods for conducting wars occurring in the post-World War II period. This qualitative jump has resulted in a radical alteration in the structure, technical equipment, and training of the armed forces, "a complete revolution in the military art and in the methods of conducting armed conflict." (p. 274) Instead of the armed

conflict being resolved in the theaters of military operations, strategic nuclear strikes will be directed against the economy, national administrative system, military bases, and armed forces simultaneously throughout the depth of an enemy's territory. The ground forces, in coordination with the Air Force, will use the results of the nuclear strikes to complete the annihilation of remaining enemy units through unrelenting attacks at great speed and in great depth. Simultaneously, the fleets will be carrying out nuclear strikes against "objectives on the continents" and searching out and destroying enemy naval units on all the oceans and seas of the globe.

In a section entitled "Nuclear rocket attacks by strategic weapons" (pp. 288-92) the authors outline the probable Soviet strategy in any future general war. The primary targets of the Soviet ICBM's will be the enemy's strategic aviation, ICBM and IRBM sites, tactical bomber aviation, naval bases, and nuclear weapon stockpiles. Incidentally, they shrug off the nuclear submarine threat in a short and pithy paragraph that merely states that the *Polaris* submarines are vulnerable to antisubmarine submarines! Pointing out that a "most important task is the destruction of the military-economic potential of the enemy," (p. 290) they list the United States and West Germany as the main economic pillars of imperialist might. The conflict will be characterized "by great violence, the mass destruction of troops, colossal destruction, and the formation of broad zones . . . of radioactive contamination." (p. 292)

The team also describes the probable offensive operations in the land theaters, defensive operations, the role of PVO *Strany* in keeping the enemy off the back of the troops and out of the homeland, and the role of the navy. In short, although the Strategic Rocket Troops are to be the

^o The authors use the neat device of quotations from various American writers to the effect that strategic bombing in World War II was a miserable failure, and they elaborate on the Soviet thesis that the Americans and British delayed the opening of the second front until the Russians had all but defeated the Germans.

fair-haired lads, there is a role for every service in the next war.

CHAPTER 7 is devoted to the problem of how to prepare the Soviet Union to repel imperialist aggression, i.e., how to stand up to a future world war. This problem of preparation is broken down into three elements: the armed forces, the national economy, and the people themselves. The availability of missiles and nuclear weapons of megaton yields permits cut-backs in conventional forces without a reduction in overall firepower. But the existence of those very weapons means that the technical and material basis for waging a long war can be destroyed at the very outset of hostilities. Lastly, one cannot disregard the fact that enormous losses in population in a very short period of time will have psychological effects, especially since it will be something new in human experience.

The authors agree that it would be nice to have peacetime forces adequate to achieve the objectives of the initial period of the war without additional mobilization, but no nation has that kind of dough. The existing peacetime forces, however, must be able to deal a nuclear blow in good time, to repel a surprise attack, and to fight theater actions while additional forces are being mobilized.

The authors point out that the whole country must be prepared as a theater of operations. Since the nation's entire territory will be dotted with missile sites, airfields, and pvo positions—all potential targets for enemy missile and air attacks—the country as a whole will constitute a theater of operations.

The rest of the chapter goes into a good deal of detail about which services must

be in readiness at all times, which should be ready for immediate mobilization, and the problems associated with general mobilization. In addition there are relatively long sections on the value of strategic intelligence, on the preparation of the national economy for war, and on how to deal with the population in the matter of civil defense.

CHAPTER 8, entitled "Leadership of the Armed Forces," is a very disappointing part of the book in that it is largely concerned with the history of command systems in the major capitalist nations and in the Soviet Union. The U.S.S.R. gets the lion's share of space, and for the historian it is an excellent survey, from an ultrapatriotic point of view, of the evolution of the command system in the Red Army from early 1918 through the Second World War.

ALL in all, the Sokolovsky book is still the most comprehensive treatment of Soviet military strategy to date. But for the Western reader it is somewhat disappointing in that it tends to fudge on some important problems of modern warfare and often compels the reader to make do with a thoroughly confused answer from this team of soldier-scholars. On the whole, the most important part of the book, at least in this reviewer's opinion, is Chapter 2, especially those sections that first appeared in the third edition.

MRS. Scott's edition of the Sokolovsky opus was hardly off the press when her husband, Colonel William F. Scott, USAF (Retired),† came out with a

† William F. Scott, *Soviet Sources of Military Doctrine and Strategy* (New York: Crane, Russak & Co., 1975, \$4.95), 72 pages.

book on Soviet sources of military doctrine and strategy. This handy monograph provides the student of Soviet military theory an annotated bibliography of important Soviet books dealing with military doctrine and strategy published between 1960 and 1974.

Colonel Scott begins with a discussion of who writes Soviet military theory and describes how the major military academies and institutes fit into the picture. He then moves on to an analysis of the newspapers and periodicals devoted to military affairs and a brief description of military book publishing business. He also includes some comments on the nonmilitary journals that may impinge upon the military field. The rest of his monograph is devoted to the bibliography itself. This section is arranged in chronological order by year of publication. As with wines, some years were better than others. For example, for 1963 Colonel Scott found only three books worthy of inclusion, while for both 1970 and 1971 there are eighteen entries.

Unfortunately, of the 168 books listed and described, only nineteen have been translated into English. These are listed at the end of the book, with information for ordering them. In the last two years six of these books dealing with Soviet military doctrine and strategy have been produced in English under the auspices of the USAF, the series entitled "Soviet Military Thought":

No. 1—A. A. Sidorenko, *The Offensive*,

Moscow, 1972. (Translated and published under the auspices of the USAF; Washington, D.C., GPO, 1973, \$1.70)

No. 2—*Marxism-Leninism on War and Army*, Moscow, Progress Publishers, 1972. (GPO, 1974, \$2.45)

No. 3—N. A. Lomov (editor), *Scientific-Technical Progress and the Revolution in Military Affairs*, Moscow, 1973. (GPO, 1974, \$2.25)

No. 4—V. Ye. Savkin, *The Basic Principles of Operational Art and Tactics*, Moscow, 1972. (GPO, 1974, \$2.30)

No. 5—A. S. Milovidov and V. G. Kozlov, *The Philosophical Heritage of V. I. Lenin and the Problems of Contemporary War*, Moscow, 1972. (GPO, 1974, \$2.35)

No. 6—V. V. Druzhinin and D. S. Kontorov, *Concept, Algorithm, Decision*, Moscow, 1972. (GPO, 1975, \$2.80)

THANKS to the assiduous labors of the Scott family and the USAF's "Soviet Military Thought" series, those interested in Soviet military theory, especially doctrine and strategy, need no longer feel debarred from the field because they read no Russian. These six books and the two here reviewed total 2280 pages, enough, one would think, to satisfy anyone except the specialist, at least for the nonce.

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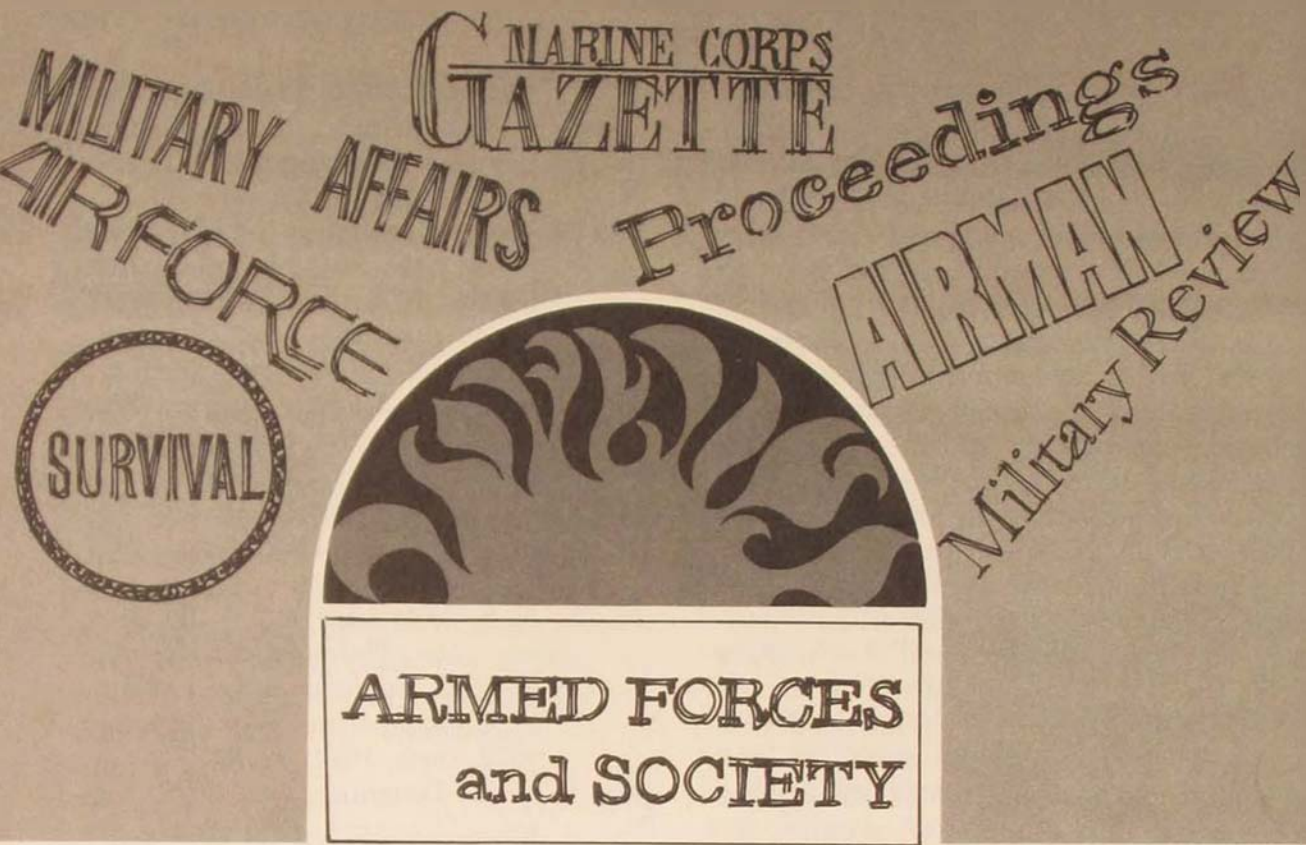
Note

1. V. D. Sokolovsky (editor), *Voennaya Strategiya (Military Strategy)*. (Moscow: Voenizdat, 1962). There were two translations of the book into English in 1963: one by the Foreign Technology Division, Air Force Systems Command, Wright-Patterson AFB, which was also published by Praeger with an introduction by Raymond Garthoff. The better version of the first edition is the RAND translation done by H. S. Dinerstein, L.

Gouré, and T. W. Wolfe and published by Prentice-Hall, Englewood Cliffs, New Jersey, 1963.

Editor's note

The books numbered 1 and 2 were reviewed by Dr. Whiting in the January-February 1975 issue of *Air University Review*.



SOMETHING NEW UNDER THE SUN

A review of *Armed Forces and Society*, a new professional journal.

LIEUTENANT COLONEL DAVID R. METS

FROM the outset of our careers, most of us will remember the “whole man” concept as an ideal established for us—and an impossible ideal at that! To meet that standard, it seemed, one would have to spend so much time in the gymnasium and the library as to guarantee that he would never make major. Indeed, it is an ideal toward which we all strive but which few have really approached.

One of the aspects of this ideal was that the officer should develop his intellect in a wide variety of disciplines. Thus, every lieutenant was to have established a professional reading program that would keep him current in world politics, the latest strategic thinking, the technology of his own and sister services, management of resources, and many other areas. As often happens, the good intentions of most of

us were enough to pave the road to hell, and the press of events often restricted us to little more than a cursory look at a weekly news magazine. Still, the ideal certainly is worthwhile, and even though none of us can hope to assimilate all the professional material available we should try to choose the best and learn as much from it as we can. This article will take a brief look at what is available in military periodicals and review at greater length one of the recent additions to the field: *Armed Forces and Society*.

To extol the virtues of the *Air University Review* here would be much like preaching the merits of church attendance to the congregation. Although the *Review* may be regarded as a company publication by many, its present editorial policy is directed toward offering more controversial articles, and the journal enjoys an increasing degree of academic freedom. For all of that, the *Review* is a government publication, its scope is fairly broad, but it does not often deal with the affairs of other services and seldom draws work from authors of other nations. While occasionally its articles are written by top scholars like professors Robert Pfaltzgraff, Jr., Theodore Ropp, etc., it is nevertheless difficult to compete with the academic journals for the work of many of the leading intellectuals who do not have a special interest in the military.

Other periodicals specifically oriented toward Air Force affairs include *Airman*, *Air Force Magazine*, and *Aerospace Historian*. *Airman*, like the *Review*, is a government publication, but its function is more to inform than to stimulate professional thought. *Air Force* is a private publication and accepts advertising. Since its goal is to promote preparedness through aerospace power, and since the interests of its advertisers inevitably have an effect, the range of articles found in it is defined by those parameters. Nevertheless,

many of the pieces are highly informative and intensely interesting. The *Aerospace Historian* is published by the Air Force Historical Foundation, a private organization though most of its members are connected with the Air Force. Edited by Dr. Robin Higham, it has been devoted to the preservation of the air heritage for a couple of decades now. Of course, there are also numerous specialized periodicals published by the major air commands and several technical publications as well. For those needing immediate currency in the technical aspects of the profession, *Aviation Week and Space Technology* is probably one of the most reliable sources available—though it, like all other commercial works, is colored by the interests of its advertisers and by the technical backgrounds of its editorial staff. Finally, *Strategic Review*, which was examined at length in our November–December 1973 issue, is important as a source covering the thinking of a distinguished group of senior officers and various foreign and domestic scholars. An older British work, *Survival*, covers much the same strategic and political ground from another viewpoint.

It is not at all difficult for the Air Force officer to remain abreast of the latest developments in our sister services. The approximate Army equivalent to the *Air University Review* comes in two separate publications: *Parameters*, of the Army War College, and *Military Review*, the professional journal of the Army from its Command and General Staff College. Both are highly reputable works aimed at slightly different audiences. The busy Air Force officer interested in a quick survey of the Army scene would doubtless find *Military Review* the more useful. It is a monthly journal in English, Spanish, and Portuguese and carries articles on a wide variety of topics. If one's interest is a more leisurely study of strategic and political thinking,

then *Parameters* should not be overlooked. The ground forces' rough equivalent to *Aerospace Historian* is *Military Affairs*. It has been published by the American Military Institute since 1933. Robin Higham is also the editor of this work, and it is more of a military history journal than one devoted purely to the past of the Army.

The Naval War College, our senior professional military education (PME) school, sponsors a journal called *Naval War College Review*. It is similar to, though smaller than, *Air University Review*. One of the oldest and most prestigious of all the military periodicals is the United States Naval Institute *Proceedings*, which has just completed its 101st volume. It is a private publication partially supported by an impressive array of advertisers. Like *Air Force*, it is dedicated to the promotion of national security through preparedness—but naval preparedness. Like *Air Force*, consequently, its material is tinted by the purpose of the work and the interests of its advertisers. The *Proceedings* is worthy of the attention of the Air Force officer who wishes to keep up with the technical and strategic thinking of his Navy counterparts. The *Marine Corps Gazette* is similar in support and purpose to *Proceedings* and *Air Force*.

The one thing that all these publications have in common is that they are supported by rather specialized interests. Either they are government publications, their advertisers are drawn from the defense industries, or their subscribership is largely limited to persons who are con-

nected with the military in some way. In fact, there has long been a need for a publication devoted to military topics but which is more or less independent of the military or the defense industries for its support. There is now something new under the sun in that the military studies have finally reached that status of academic respectability that enables self-support of a scholarly journal on the subject.

Armed Forces and Society published its first issue during the fall of 1974. It is sponsored by the Inter-University Seminar on Armed Forces and Society, which was formed more than a decade ago in this country and has since spread overseas. There was no civilian school in the land then which specialized in military studies, nor was there any one discipline fully qualified to examine all aspects of the subject. Thus, the Seminar is composed of distinguished scholars from many different countries, disciplines, and institutions. Among them are Raymond Aron, Morris Janowitz, Jacques van Doorn, Adam Yarmolinsky, Richard Rosser, and Amos Jordan—to name only a few. The stated purpose of the journal is to provide a forum for papers on war, arms control, armed forces, revolution, and peacekeeping. It was hoped that this would encourage research and discussion of these topics on an international plane and from a great variety of scholarly viewpoints.

At this writing, five issues of *Armed Forces and Society*† have appeared—it

†*Armed Forces and Society*, An Interdisciplinary Journal on Military Institutions, Civil-Military Relations, Arms Control and Peacekeeping, and Conflict Management, published quarterly by the Inter-University Seminar on Armed Forces and Society. Address: Armed Forces and Society, Social Science Building, University of Chicago, Chicago, Illinois 60637. Subscriptions: Professionals and teachers, \$12 per year.

is a quarterly publication. Generally, each issue has a broad variety of articles, but the Spring 1975 issue was devoted to "Political Participation under Military Regimes." The effects of the creation of the all-volunteer forces and professionalism in the military are topics frequently addressed. Civil-military relations constitute another area of interest. Sociologists were prominent among the founders, and a good many of the articles arise from that discipline. But *Armed Forces and Society* is certainly not a sociology journal; it contains work by many historians, political scientists, and economists. It would be easy for the professional officer to assume that such a periodical would have a built-in antimilitary bias, but such is not the case. Though some of the articles certainly are hostile to the armed forces and especially to defense spending, some of the others are actually promilitary, and the greater number of them maintain a balanced viewpoint. Authors vary from the likes of Seymour Melman of Columbia (Summer 1975), who comes close to blaming defense spending for all the world's troubles, to William Taylor of West Point's Department of Social Sciences (Winter 1975).

The topic of the volunteer army receives much attention from the scholars; granting that the recruiting goals are being met, they are nevertheless worried about the social complexion of the ground combat arms and fear the possibility that the armed forces may become alienated from the society they serve. In one of the best articles so far published, Morris Janowitz and Charles Moskos address the problem and propose some solutions (Fall 1974). The early experience with VOLAR (All-Volunteer Army) has shown that there is a strong tendency for the black portion of the Army and Marine Corps ground combat arms to increase beyond

that predicted by the Gates Commission. Since it is assumed that the armed forces must be as close as possible to a cross section of the society as a whole—anything else may cause group loyalty to take precedence over national loyalty—Janowitz and Moskos propose a number of steps that might correct the imbalance. One, designed to increase the individual's identification with his unit, would permit enlistment or re-enlistment for a particular unit and cut down on the number of transfers. They suggest that this might make service more attractive for the whites. Since the blacks seem to be enlisting and especially re-enlisting for economic motives, it is further proposed that the educational incentives be emphasized for two reasons: first, to make the ground forces more attractive to whites and, second, to make a transition to an economically rewarding civilian life more feasible for the blacks.

In a more recent issue of *Armed Forces and Society* (Fall 1975), Jerald Bachman and John Blair of the University of Michigan develop the educational idea a bit further. Basing their research and recommendations on a sample taken from the enlisted Navy, they suggest that the services deliberately promote a high turnover of first-term enlistees—that re-enlistments be purposely discouraged! They recognize that this would be an expensive proposition, but they hold that it would be highly desirable as a method of preventing the ideological alienation of the all-volunteer military. They would emphasize education as an incentive and thus hope to attract very high-quality enlistees, who, they hope, would compensate for the high costs of the education and rapid turnover by delivering superior performances for the short term they are in the service. Perhaps. Incidentally, a bit of the bias suggested earlier does creep into this

article when the authors imply that the best of the enlisted men tend to be the most antimilitary and the least likely to re-enlist. Of course, such a judgment is highly subjective and would be wholly dependent upon one's definition of "best." It is certainly conceivable that the most able will be the quickest to see great economic rewards waiting on the outside; it is also conceivable that the least bold will go running home to mother at the earliest opportunity. Their sample was too small for the judgment arrived at.

Civil-military relations and military professionalism are other, related, topics which receive a good deal of attention. Much of the work on professionalism is done from a historical perspective. M. D. Feld of Harvard contributed two articles on the subject: one (Summer 1975) on the origins of the professional army in the Netherlands under Maurice in the sixteenth century; and the other (Winter 1975) on the evolution of the mass army from its inception at the time of the French Revolution to its apparent demise in the last few decades. William Skelton adds a superior article, "Professionalization in the U.S. Army Officer Corps during the Age of Jackson" (Summer 1975), which is accompanied by one from Great Britain: Gwyn Harries-Jenkins's "The Development of Professionalism in the Victorian Army" (Summer 1975). The trends of thought among these scholars seem to be that the alienation of the officer corps from the rest of society is a possible danger, but not inevitable; that the days of the mass army are gone—with the implication that technology will have to do what bodies once did (or tried to do); that the military profession will decline in attractiveness but demand officers of an ever higher quality—and therein lies the problem for our policy-makers.

The education of the officer corps is a topic naturally of interest to an organization of scholars. Thomas Brewer of Eastern Michigan University wrote "The Impact of Advanced Education on American Military Officers" (Fall 1975) which addresses the subject. His conclusion is that education does not make a profound difference in the outlook of the officers concerned but only makes them a bit more articulate in their views and perhaps a little less rigid in their approach to foreign policy. The conclusion is probably sound enough, and not very surprising. The idea that a substantial number of successful men would radically change their views as a result of nine months of schooling is improbable in any event. The problem with the article is that the sample is far too small and the scope of the study is quite narrow. He deals with fewer than 100 individuals, most of whom are naval officers and, one would suspect, a substantial proportion of whom are Naval Academy graduates. Further, he does not address large portions of the curriculum nor discuss the purposes of the Naval War College. Finally, Brewer makes some rather sweeping generalizations about the impact (or lack of impact) of civilian graduate education on the thinking of military officers. For the data on this topic, he draws only upon those students attending a graduate program immediately associated with the Naval War College—one which could hardly be typical of the graduate education received by service officers at a very great number of civilian universities having no direct connection with the armed forces.

Sam Sarkesian and William Taylor, in "The Case for Civilian Graduate Education" (Winter 1975), assign a much greater effect to civilian graduate courses than did Brewer. According to them:

. . . Graduate education has a decided positive impact on professional competence, prestige, and leadership qualities, while reinforcing civilian control and democratic values; it must become an integral part of the professional career—not tangential.

The authors complain that civilian graduate education is a peripheral thing for the officer, that it has an inferior status to graduation from the (usually shorter) war colleges. They propose that it be given equal status to the war colleges insofar as it is a qualification for service at higher levels and that greater numbers of officers be sent to civilian schools instead of the professional military schools. To finance all this, they would eliminate the war colleges at Newport, Carlisle Barracks, and Maxwell AFB along with the Industrial College of the Armed Forces and the National War College. They would substitute a national defense college. Taking the place of all the others, this institution would be staffed by officers from all the services. Rather a radical proposal, to be sure, but it might have more merit than only that previously cited as arising from civilian graduate instruction.

There are other fine articles in *Armed Forces and Society* by important scholars like Louis Morton, George Quester, and Morton Kaplan—to cite only a few—but there is not space here to review all of them. One last note about a piece written by Lawrence J. Korb, “The Bicentennial Defense Budget, A Critical Appraisal” (Fall 1975): His logical and interesting message is that cuts in defense spending are inevitable, and if we of the armed forces do not propose our own cuts based on strategic realities, then the Congress or the public will force cuts on a more or less random basis that will hurt us a good deal more. Korb is more than ready with a list of “marginal” programs that could be cut

without damage to the muscle of the armed forces:

- The B-1 program
- The AWACS program
- The three additional Army divisions
- Many reserve formations
- Any additional spending on counterforce.

It should come as no surprise to Air Force and Army readers that Dr. Korb is on the faculty of the Naval War College!

Armed Forces and Society does not provide a panacea for the problem we face in planning a manageable professional reading program. Of course, there is little or nothing in it on the details of technology. Few of the articles are aimed at the problems of any particular service. The book reviews, while interesting and useful, certainly do not cover the range of books of interest to the professional officer. There is some material on military theory and doctrine but not enough for the Air Force leader—and that which has appeared so far is in a form that does not help one’s strategic thinking very much. Yet I do believe that the Inter-University Seminar has provided us with a worthwhile addition to our reading lists. First, *Armed Forces and Society* will give us more critical insights to our military institutions than are available in any of the professional journals—and it will do so from a variety of disciplines. Second, it will give some understanding of the thinking of scholars from other lands—mostly European. Third, it might offer a prestigious outlet for the work of the officer-scholar. Finally, it makes available in convenient form a high level of social-science scholarship devoted especially to the problems of our military profession and its relationship to the society which it serves.

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Books Received

The abundance of new books published each month makes it difficult for most of us to remain abreast of the current pertinent literature, and at some more-remote bases the task becomes formidable. It is hoped that this new feature, "Books Received," will ease the chore.

The present listing includes books received during 1975 and early in 1976; subsequent lists will be published from time to time. Some of the books listed here will be reviewed in later issues of the *Review*.

I. AIR POWER

- Edwards, Roger. *German Airborne Troops*. New York: Doubleday, 1975. \$7.95.
- Freeman, Roger A. *Mustang at War*. New York: Doubleday, 1975. \$10.00.
- Fuller, John F. *Weather and War*. Scott AFB, Illinois: Office of MAC History, 1975.
- Gregory, Barry. *British Airborne Troops*. New York: Doubleday, 1975. \$7.95.
- Higham, Robin, and Abigail Siddal. *Flying Combat Aircraft of the USAAF-USAF*. Ames, Iowa: Iowa State University Press, 1975. \$7.95.
- Hurley, Alfred H. *Billy Mitchell*. Bloomington, Indiana: Indiana University Press, 1975. \$10.00 cloth, \$2.95 paper.
- Jackson, Robert. *Air War over Korea*. New York: Scribner's, 1975. \$9.95.
- Kullar, Amarjeet. *Effective Airpower for Developing Countries*. Delhi: The Macmillan Company of India, 1975. Rs40.00.

II. AVIATION: TALES, TECHNIQUES, AND TECHNOLOGY

- Buck, Robert N. *Flying Know-How*. New York: Dell Publishing, 1975. \$7.95.
- Buckwalter, Len. *The Pilot's Night Flying Handbook*. New York: Doubleday, 1976. \$8.95.
- Cain, Charles W. *Aircraft in Profile*, vol. 14. New York: Doubleday, 1975. \$11.95.
- Hunt, Leslie. *Veteran and Vintage Aircraft*. New York: Scribner's, 1975. \$12.50.

- Horonjeff, Robert. *Planning and Design of Airports*. New York: McGraw-Hill, 1975. \$24.95.
- Ishoven, Armand van. *Messerschmitt, Aircraft Designer*. New York: Doubleday, 1975. \$14.95.
- Jack, Donald. *It's Me Again*. New York: Doubleday, 1975. \$7.95. A humorous account of flying in World War I.
- Taylor, John W. R. *Civil Aircraft of the World*. New York: Scribner's, 1975. \$6.95.
- _____. *Jane's Pocket Book of Military Transport and Training Aircraft*. New York: Macmillan, 1975. \$6.95 cloth, \$3.95 paper.
- Walsh, John Evangelist. *One Day at Kitty Hawk*. New York: Crowell, 1975. \$10.00.

III. MILITARY AFFAIRS

- Barker, A. J. *Prisoners of War*. New York: Universe Books, 1975. \$8.95.
- Barnett, Correlli. *The Swordbearers*. Bloomington, Indiana: Indiana University Press, 1975. \$15.95 cloth, \$4.95 paper. On generalship in World War I.
- Bekker, Cajus. *Hitler's Naval War*. New York: Doubleday, 1975. \$12.95.
- Blumenson, Martin, and James Stokesbury. *Masters of the Art of Command*. Boston: Houghton Mifflin, 1975. \$12.95. Broad study of military leadership from the NCO to the generals' level.
- Brownlow, Donald Grey. *Panzer Baron: The Military Exploits of General Hasso von*

- Manteuffel*. North Quincy, Massachusetts: Christopher Publishing House, 1975. \$9.75.
- Carter, Anthony, and John Walter. *The Bayonet*. New York: Scribner's, 1975. \$8.95. A technical history of the weapon, 1850-1970.
- Cortright, David. *Soldiers in Revolt*. New York: Doubleday, 1975. \$7.95. On attitudes among the troops of the U.S. Army during the Vietnam war.
- Davis, William C. *Duel between the First Ironclads*. New York: Doubleday, 1975. \$8.95.
- Dramesi, John A. *Code of Honor*. New York: Norton, 1975. \$7.95. On the author's escape from a Vietnamese prison.
- Druzhinin, V. V., and D. S. Kontorov. *Concept, Algorithm, Decision*. Washington: Government Printing Office, 1975. \$2.80. Part of a USAF series that examines the thought of the Soviet military on automation of the decision-making process within the Russian armed forces.
- Foss, Christopher F. *Armoured Fighting Vehicles of the World*. New York: Scribner's, 1975. \$7.95.
- Goldhamer, Herbert. *The Soviet Soldier*. New York: Crane, Russak, 1975. \$17.95.
- Henderson, George. *Human Relations in the Military*. Chicago: Nelson-Hall, 1975. \$14.00.
- Hodgson, Pat. *Early War Photographs*. Greenwich, Connecticut: New York Graphic Society, 1975. \$12.00.
- Howard, Michael. *The Theory and Practice of War*. Bloomington, Indiana: Indiana University Press, 1975. \$12.50 cloth, \$3.95 paper. A collection of the author's essays, chronologically arranged.
- Hughes, B. P., Major General. *Firepower: Weapons Effectiveness on the Battlefield, 1630-1850*. New York: Scribner's, 1975. \$12.50.
- Hunt, Robert, and Tom Hartman. *Swastika at War*. New York: Doubleday, 1975. \$9.95. A photographic study of World War II in Europe.
- Kennedy, Gavin. *The Military in the Third World*. New York: Scribner's, 1975. \$17.50.
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Where all think alike, no one thinks very much.

WALTER LIPPMANN

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