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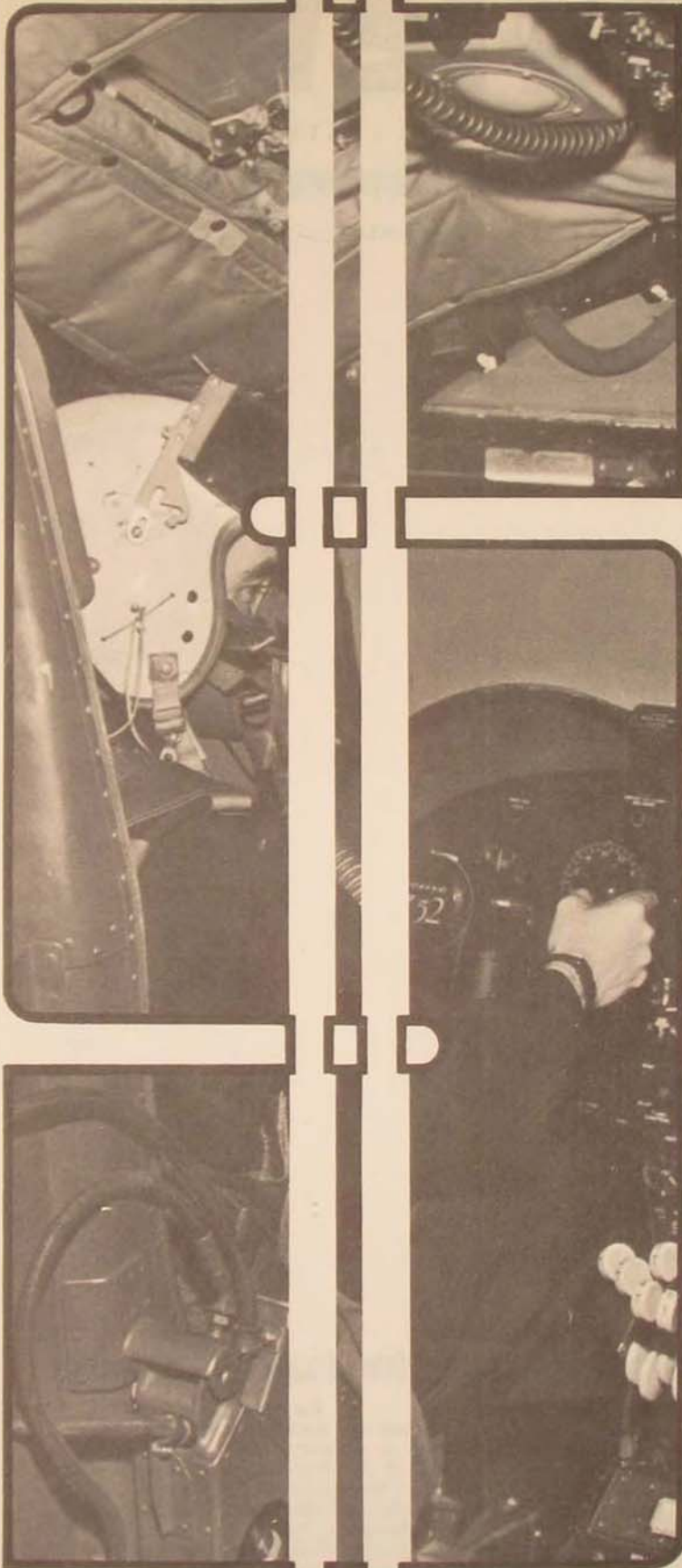
THE PROFESSIONAL JOURNAL OF THE UNITED STATES AIR FORCE

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the cover
Just as each cog must smoothly mesh with its neighbors in a train of gears, so the myriad elements of Air Force operation must merge with the "initiative, professionalism, teamwork, loyalty, and dedication" that Lieutenant General George S. Boylan, Jr., enumerates, to effect optimum efficiency in an era of budgetary cutbacks. General Boylan and others from his deputation of Programs and Resources discuss aspects of this continuing effort.



PROGRAMS AND RESOURCES

*The Challenge to Air Force
Management*

LIEUTENANT GENERAL
GEORGE S. BOYLAN, JR.

A REALISTIC assessment of conditions influencing our current and future programs and resources posture makes clear that Air Force management must face a severe test. I would be remiss if I were to understate the difficulty of the situation we face and the vital importance of the outcome.

We have a problem, and most certainly we will work out a solution. In simple terms, our problem is that of structuring current and future capability to perform increasingly complex mission responsibilities and doing this with decreasing resources. The optimum solution can come only from more effective management.

Most of us are inclined to think of management as something somebody else is responsible for. But let's face it, management is not a mechanical abstraction functioning at some level beyond the influence or responsibility of the individual commander, officer, noncommissioned officer, airman, supervisor, and worker. On the contrary, effective management derives from the team. It is sustained by initiative and imagination, a shared sense of responsibility for achieving common objectives, and a mutual participation in the large and small aspects of an organization. We are management. We have the challenge. Where do we go from here?

Secretary of Defense Melvin R. Laird has focused on certain management fundamentals in articulating a revision of procedures in the management philosophy of the Department of Defense. We expect increased emphasis on decentralizing management authority to the operating level. Not only will such decentralization put the responsibility where the action is, but it can also free upper levels of management for greater concentration on policy matters.

Another element of Secretary Laird's revised approach calls for a fiscally constrained budget rather than a requirements-based budget. Given broad strategic and fiscal guidance from the Secretary of Defense, we of the Air Force now have the responsibility for initiating and giving relative weight to our programs as opposed to largely reacting to

detailed proposals and rationales developed by higher authority.

These changes are welcomed because we should (and I believe we do) know better than any other agency how to derive the best combination of Air Force forces within the bounds of governing fiscal and policy parameters. As we assume the privilege of such initiative, however, we also accept the serious obligation for evolving a corporately *responsible* program. In this context the planning/programming/budgeting interface within the Air Force becomes critical to our near-term and long-term future.

Substantial reductions in force elements as well as total resources are a virtual certainty. Addressing a Los Angeles audience this past January, Secretary Laird stated that "we are moving toward smaller and more efficient military forces." In the same speech he said: "Fewer personnel and better management plus a stiff backbone produce budget reductions." There can be no doubt that the Air Force is in the process of change and that much of the change will be necessitated directly by resource limitation.

Change is not new to the Air Force, but the magnitude of changes to come may be a completely new experience for us. As resource constraints become clearer, appropriate balance must be maintained among our program elements as the structure accommodates to adjustments. Equally important, we must make provision for future as well as present capabilities.

My principal task as Deputy Chief of Staff/Programs and Resources is to evolve and recommend a series of "smooth" program curves that, in the main, are stabilized over time. Near-term decisions must be considered within a longer-term context. In the Air Force, as in most organizations, the status quo is a powerful argument. But the question will be asked, "Can we accomplish the same result in a different way for less?" That question must be asked across the entire Air Force structure and directed to a myriad of functions from top to bottom.

As we accommodate to change, we must avoid potentially wasteful stop-start program

management reactions to budget curtailment pressures. "Painless" expedients can be attractive for the present—and devastating for the future. For example, some might argue that we can live within a reduced FY 1971 budget by eliminating expenditures for activities that will not have a payoff during the current fiscal year: research and development, pilot training, construction starts, new aircraft development, real-property maintenance, and many similar items that are claimants for available resources. Future consequences of such expedient actions are predictable if not self-evident.

The Secretary of the Air Force and the Chief of Staff are as concerned, if not more so, about the Air Force of the future as they are about the Air Force of the present. From their viewpoint, there is an overriding need for efficient program continuity projected well into the future. Decisions will be progressively more difficult as the resource base (force and support) is reduced.

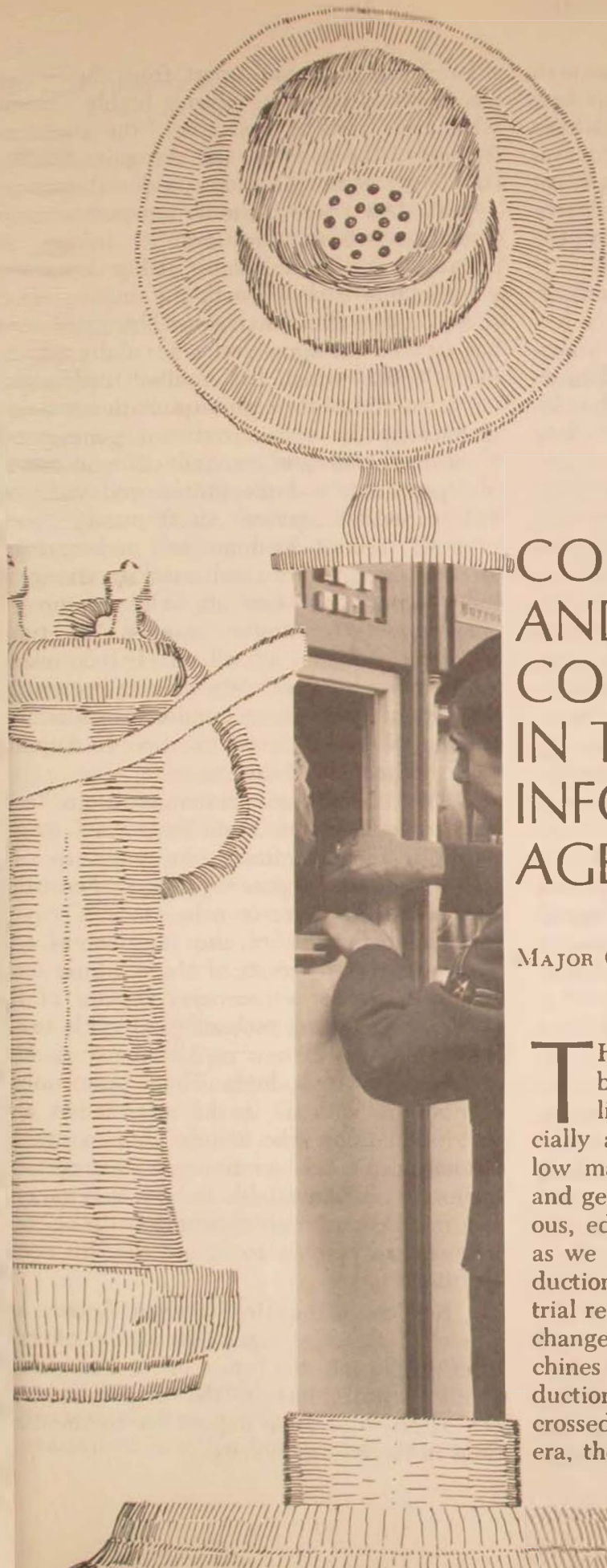
Many problems of major significance, for which there is no simple solution, must be resolved. With a few notable exceptions, our equipment continues to age, and modernization needs are becoming progressively urgent. Not only are we faced with a reduction in total budget dollars; the buying power of our budget has been diminished by an inflation factor somewhat in excess of 25 percent during the past ten years, suggesting that a 1970 aircraft procurement dollar will purchase roughly 75 percent as much airplane as did the 1960 dollar. Furthermore, the share of our annual budget devoted to overhead and support continues to grow at the expense of procurement, construction, and research and development. Such are the problems we face in our programming environment. They represent a complex management challenge.

Elsewhere in this edition of *Air University Review*, Lieutenant Colonel C. W. Lamb presents a novel concept for application of a life cycle costing technique in the area of Air Force facilities. This is an example of a management approach calculated to avoid actions today which unintentionally impose excessive demands for operations and maintenance funding in future budgets. Another technique, whereby Air Force activities can improve their internal management efficiency, is presented by Lieutenant Colonel William D. Bathurst in his discussion of the management consulting services available to commanders and managers through our management engineering teams.

The Air Force of the future will certainly be a trimmed-down version of what it is today. Marginal operations most certainly will be eliminated. Many organizational arrangements as we now know them will be reshaped, and their assigned personnel will be called upon to channel their talents into hard-core mission and productive support needs. With reference to support activities, the future Air Force must show a significant shift of resources from the support base into the operational force elements. This change alone will tax our ingenuity and programming skill.

Present and future Air Force management does indeed face a challenge. The manner in which we structure our programs and employ our resources is key. All Air Force members—officers, airmen, and civilians alike—will face this challenge and deal with it in a very real and very personal sense. Initiative, professionalism, teamwork, loyalty, and dedication will determine the extent of our success. Succeed we must, for in large measure the security of the nation will continue to depend on the readiness posture of the Air Force.

Hq United States Air Force



COMPUTERS AND COMMUNICATIONS IN THE INFORMATION AGE

MAJOR GENERAL GORDON T. GOULD, JR.

THREE hundred years ago we were basically an agricultural society. Man lived and worked in family units, socially and physically separated from his fellow man. Communications between societies and geopolitical entities were slow and laborious, education was limited, and management as we know it today did not exist. The introduction of the machine generated the industrial revolution, which produced a tremendous change in our environment by applying machines to man's work. Today, with the introduction of the electronic computer, man has crossed the threshold of a new revolutionary era, the "information age." The new machine

is not one that extends our muscles; it involves information and its communication. This new information age, exploited by the capabilities of computers and modern communications systems, has the potential for a more significant impact on the framework of our socioeconomic system than that produced by the industrial revolution.

Computers have the capability to store, process, and provide vast amounts of information. However, in most instances, it is necessary to transmit large volumes of data to the computer before it can produce the desired products. Thus, there is an interlocking relationship between data processing as performed by computers and data transmission as provided by communications networks. What may not be so evident is the fact that this is a changing relationship.

Most computers operate today in what may be called an off-line mode. In this mode there is no direct connection between the communications network and the data processor (or computer). A human interface is required to take information received through the communications system and put this information into the computer. As a matter of fact, the executive or staff user of the computer does not generally have direct access to it. Rather, his interface is through the technician-operator. Thus, there exist significant limitations in both the machine-to-machine and the man-to-machine relationships. This is changing.

Third-generation computers, which is a way of describing the current offering in the marketplace, are laying the groundwork for machine-to-machine capabilities as well as providing a direct interface between user and machine. The result is an ever increasing spiral of expanding computer applications with an accompanying rise in data transmission requirements.

Unfortunately, the traditional separation that has existed in the management of the two types of capabilities—communications and computers—is not conducive to the establishment of principles that facilitate the convergence that is taking place. One result is that the rising costs of communications are con-

sidered and bewailed apart from the cause. These rising costs are always highly visible, while the "fruits of their labor," the increased savings of the user, are not recognized in the context of communications-produced savings.

The Air Force is the largest user of computers and communications of any federal agency in the United States. It has developed considerable experience in the on-line, time-shared use of these machines. This experience has created an appreciation for the utility of these "tools," which has resulted in demands for capabilities through exploitation of new technology for specialized management. As a result, logisticians can reduce depots, people, pipelines, and inventories and still provide expedited service. Airlift managers can improve aircraft loadings and reduce turnaround times, with a commensurate savings in time, people, and aircraft, while improving efficiency. In a similar manner, the time-sensitive problems of effectively controlling modern weapons and delivery systems require the capability to process and transmit a large volume of requisite information to support command control decisions.

The use of new communications techniques, such as satellites, lends itself to the demands for communications paths to support this new computer technology. Nevertheless, if the Air Force is to be ready to exploit the full capability of the information age, well-validated forecasts of the required communications support are needed. One of the by-products of any technological explosion is the uncertainty of how rapidly the consumers will exploit its products. These same uncertainties are with us in the information age; and it is the user who will decide how rapidly he will capitalize on the new management techniques now available to him. It is imperative that he work in partnership with the communications planner to ensure that his needs are met.

Readers of the *Air University Review* are a part of this new age. This article offers a brief insight into the future of Air Force command control systems, the employment of computers, and their impact on communications in the information age.

Computers and Communications in Management

Most people are familiar with the computer or data processor, generally located in the "back room." These are the machines that accomplish off-line "bulk processing." They turn out reports, present statistical data, solve mathematical problems, and perform general bookkeeping functions. However, as indicated earlier, their availability and flexibility are somewhat limited. The new generation of computers, with their real-time and time-sharing applications, make it possible to remove these limitations. Computers can now be readily accessed by other computers or by people through time-sharing plans and remote input/output devices coupled through communications; thus, they are bringing computer operations out of the back room by extending direct access to the computer to the user. Because of this new flexibility, there is an ever increasing percentage of computers dedicated to real-time and time-sharing applications through the use of communications systems to improve management control and shorten the long chain of command. As a result, Air Force officers will find that they are becoming increasingly involved with some aspect of this new management philosophy.

Within the management area, computers should, in most cases, offset their acquisition costs and their operations and maintenance costs through improved efficiency. The Air Force Logistics Command has projected significant command savings through the development and implementation of the Advanced Logistics System (ALS). The ALS will use only seven major computer centers, and they will communicate computer-to-computer through the necessary interface devices and the *Automatic Digital Network* (AUTODIN).

Command Control—a Premium Slice of Management

Command control is a specialized form of management; it is not the commander's total management function but a select part of his

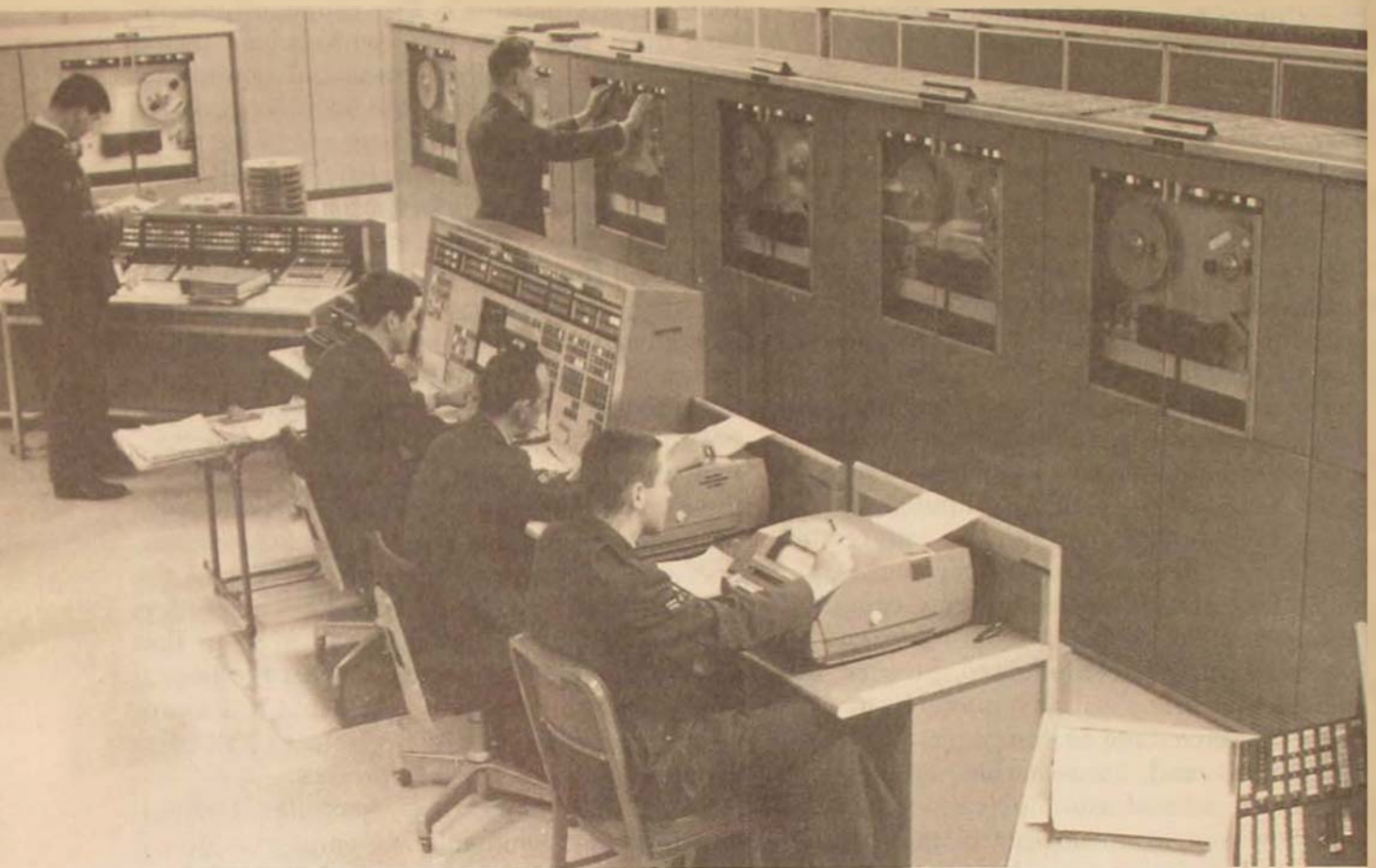
total management task. The command control task must focus on the commander's prime mission, and the term "command control" is most meaningful when the mission involves military operations that are normally time-sensitive. The principal ingredient in this time-sensitive process is information.

With the constant stream of data that modern technology can provide, considerable expertise is necessary to select that which is relevant to the situation from that which is unimportant. Thus, the "premium slice of management" requires selection of the essential elements of that "specialized knowledge" which each functional area must contribute to the commander for his decision-making task. The objective of this type of specialized management is to reduce the uncertainties in the decision-making process. Today's commanders require systems that focus on those items that are truly significant. In this respect the importance of the information age is that it has provided new tools that contribute to the commander's decision-making process.

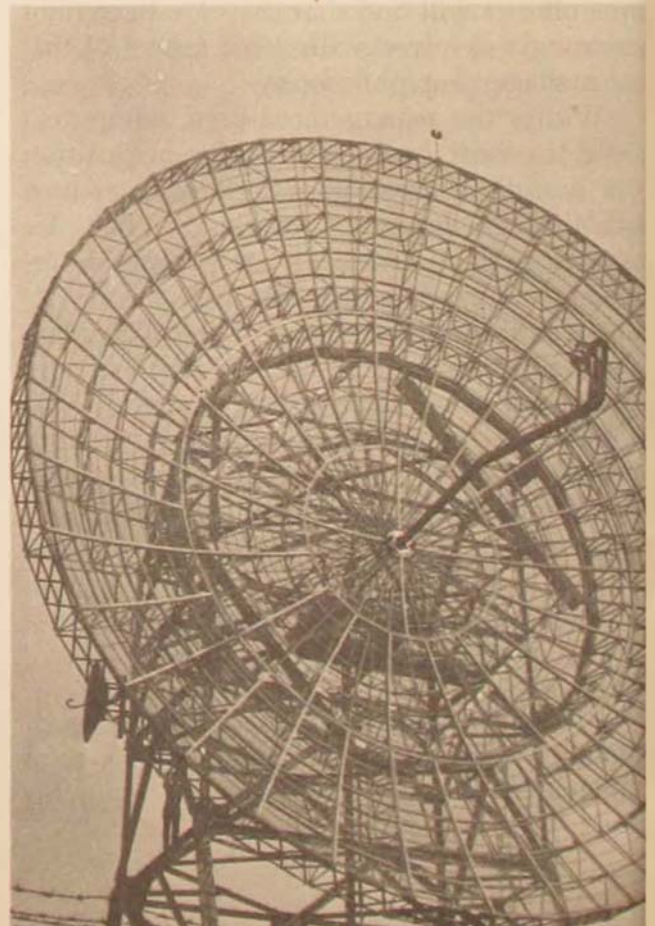
The communications/computer technology permits a commander to employ modeling and simulation, operational analysis, and gaming to test theories, plans, and possible courses of action. Alternatives can be weighed and a variety of stimulus/response techniques can be utilized to establish potential reactions to future threats and courses of action.

Command control does not represent a military capability in itself but is an instrument or tool through which military capability can be effectively controlled. In the nuclear age the term "controlled" is particularly significant. Therefore, in designing a command control system, we must make some difficult decisions and tradeoffs. The system cannot possibly contain all the desired features, for it would then be defeated by the sheer magnitude of the functions placed upon it and would probably price itself out of reach. Consequently, early in the design of such a system, some careful delineations of precisely what is desired must be established.

The design phase must consider the military, political, and economic factors as well as available technology. Since knowledge is the



The interior of one of the electronic switching centers of AUTODIN, which is the world's largest and most advanced digital communications system. Originally conceived primarily to meet the Air Force logistical requirement for speedy information worldwide, its capacity enables extension of its advantages to other military departments and government agencies.



The dishlike antenna at Jones Park, Korat, Thailand, sends messages to Tahli, which are relayed to an orbital satellite, then to the Navy-operated ASC at Wahiawa, Hawaii, and on to destination—all part of the extensive information linkage of AUTODIN.

principal ingredient of a command control system, it follows that the design of such a system requires answers to certain questions:

- a. What information is really needed?
- b. Where are the sources, and what are the procedures for its acquisition?
- c. Who should receive the information and in what form?

The requirement to acquire and process critical data from the lowest operational level to the highest decision-makers is a formidable but vital task. Recent examples have shown the need for the expeditious handling of time-sensitive information and the establishment of positive command control capabilities. The House Armed Services Committee concluded, from its investigations of the *Pueblo* and EC-121 incidents, that our complex military structure is capable of acquiring almost infinite amounts of information. However, they also concluded that improvements are vitally necessary in the ability of the structure to relay critical, time-sensitive information to the appropriate decision-makers. This indicates the need to develop and improve command control systems to optimize all aspects of the "premium slice of management" that the command control function demands.

Computers and Communications in Command Control

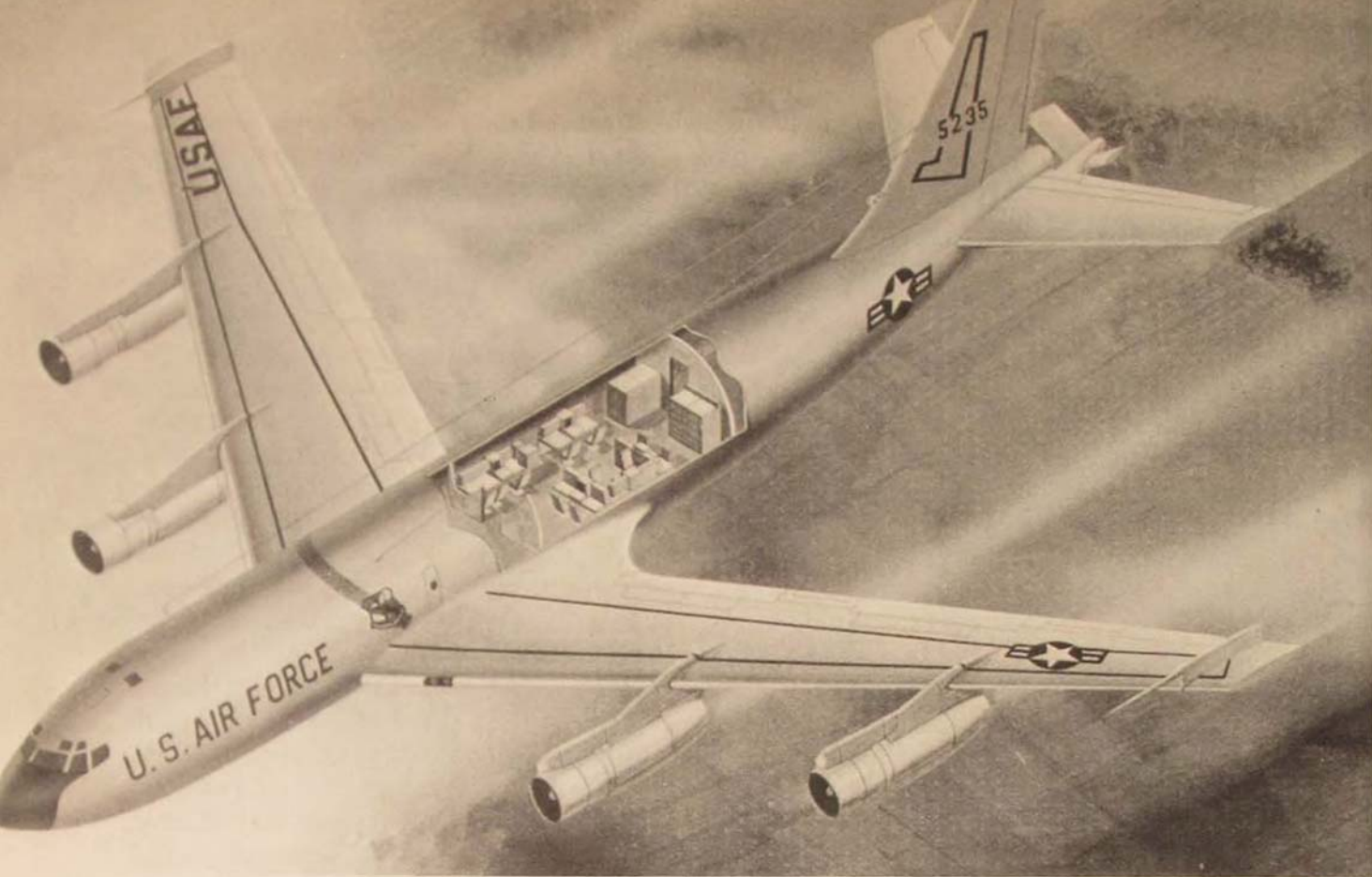
As far back as 1962, during the Cuban crisis, President Kennedy recognized that he was not receiving the detailed and timely information needed for crisis management. This shortcoming resulted in the formation of the World Wide Military Command and Control System (wwmccs). The objective of wwmccs is to provide the National Command Authorities (the President, the Secretary of Defense, the Joint Chiefs of Staff, and their authorized successors) a command control system that is capable of meeting their decision-making information requirements concerning military situations wherever and whenever they might occur.

Subsequently, the services and commanders in chief (CINCs) brought into being sys-

tems that served their specific needs primarily and addressed the overall integration of systems secondarily. Hence, these unilaterally developed automated systems evolved in the direction of meeting the needs as they existed at the time. With the current and future emphasis on joint operations, it now becomes imperative that we direct our attention to the overall integration of these systems to meet the objectives of wwmccs. This integration requires compatibility between systems and standardization to the extent possible.

The world situation poses a constant challenge to commanders in posturing their forces to meet a multitude of threats, but there are few set rules as to how a commander will do this. Most certainly the tactics available vary considerably with the character of the threat, the size of force available, and the type of forces employed, i.e., land, sea, and air. If one contrasts the defense mission of the Continental Air Defense (CONAD), the nuclear offense mission of the Strategic Air Command (SAC), the airlift mission of the Military Airlift Command (MAC), and the tactical mission of the Pacific Air Forces (PACAF), it becomes readily apparent that standardization in command control can never approach the high level of standardization that exists in the well-defined areas of supply, finance, personnel, etc. The problem is difficult enough when addressing only the Air Force, but it becomes even more confusing when the Army, Navy, Marine Corps, and CINC requirements are involved. It becomes obvious, then, that we must integrate these automated systems in a manner which insures the free exchange of information while retaining the flexibility essential to the conduct of the user's diverse missions.

In recognition of these requirements for flexibility, compatibility, and standardization, the Department of Defense has initiated a program to procure a standard, compatible family of new third-generation computers. These new computers will support the fixed headquarters of the wwmccs and those Intelligence Data Handling System (IDHS) computers that are wwmccs-oriented. Standard computer languages and standard training are also a part of this program. The plan is to



The Airborne Data Automation (ADA) computer in the Strategic Air Command's airborne Command Post provides information necessary for the Commander's time-sensitive command and control decisions.

provide for the interchange of information through standardization and compatibility of equipment and supporting software; but the system retains flexibility by tailoring the hardware and operational software to each user's needs. Thus the objectives of an integrated WWMCCS that meets the information needs of our national leaders can be achieved on a timely basis and in the scope required.

This standardization will set the stage for the eventual exchange of data automatically between computers and provide a capability for complementary, distributed data bases in a command control computer network. However, this flexibility will depend on the capabilities of the worldwide facilities of the Department of Defense Communications System (DCS) and the tactical communications of the services. It is appropriate, then, to discuss the impact command control systems and other computerized management systems can have on these communications.

Impact of Computers on Communications

The communications systems used today have evolved over the past fifteen years to meet the needs of that period. During this time the principal problem was one of people talking together. Therefore, most of our communications links were designed primarily to solve the "talking" problem; they were not designed to handle the large quantities of high-speed, high-quality data that computerized systems are capable of generating.

Today 84 percent of the usable channels of the Defense Communications System are still allocated for voice use, and many of the early systems that provide these channels are designed for a relatively low mix of data compared to voice. Many of these older communications systems are at the threshold of their capability to carry data—some of them have already crossed that threshold. In addition to

the problem of quantity, there is also a quality problem. These systems were not designed to carry efficiently the high-speed, high-quality data generated in support of our data processing systems. It is apparent, then, that the primary impact of computer-generated data on the communications system requires restructuring our system to handle tomorrow's needs. How severe this impact will be on communications will depend upon how rapidly computer-generated data expand, how much and where restructuring is required, and how this realignment is accomplished. Before discussing these subjects, let us forecast the need.

Accurate forecasts required

Forecasts related to a rapidly expanding technology cannot be made by the planner with any assured accuracy. A case in point is a current problem confronting the New York Telephone Company, the largest of AT&T's 24 operating companies. They are in serious trouble today because last year's forecast was not accurate. Despite the efforts of their highly professional marketing staff, their forecasts were too conservative: they were planning for a four percent increase in service, but the demand increased sixteen percent. As a result their system is overloaded, and whole exchanges are breaking down during the busy hours.

The military has an even greater problem than the commercial concerns. The DoD Communications System (DCS) has worldwide coverage rather than being limited to the United States. Also the Defense Communications Agency (DCA), which manages the DCS, does not have the extensive marketing capability of its commercial counterparts. They have to depend on the services and other agencies of the DoD to provide requirements and indications of trends. Therefore, users must ensure that requirements are known, so that services are available when needed. Users cannot just assume that the DCS or commercial systems will have the required facilities to meet their needs. Their hard requirements, along with the trends and indicators developed by the

DCA planner, can then be used to establish more accurate forecasts.

future data communications trends

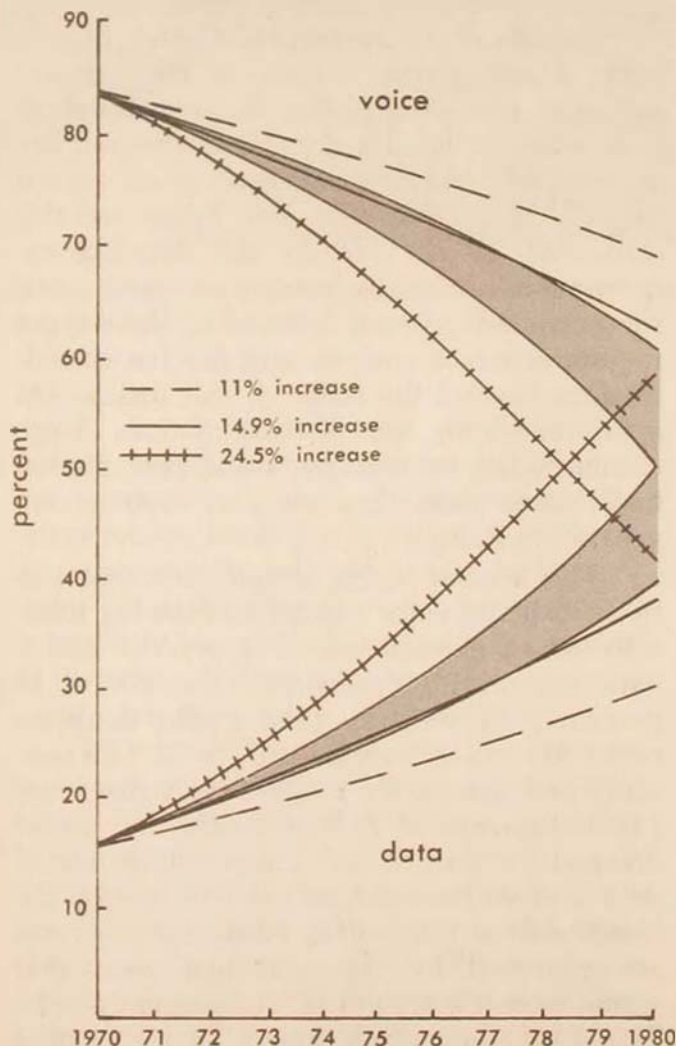
There are a number of studies available which forecast the growth of communications required to meet the needs of projected data systems. One study indicates data traffic will expand by 600 percent over the next five years, but some of the traffic figures for the individual systems projected in this study are not fully substantiated and can readily be challenged as much too high. Therefore, there is a need for more careful validation of the characteristics of systems proposed. This need is clearly illustrated in the following example.

As indicated earlier, approximately 84 percent of the usable circuits in the DCS are allocated for voice traffic; the remaining 16 percent are devoted to data. Over the past five years data traffic has increased at an annual rate of about 11 percent. This figure and this discussion do not include the data-like requirements related to imagery or special sensor-generated systems. Systems of these types require separate analysis and involve considerations beyond the scope of this article. On a full-time basis, one of these systems in operation today, for example, could generate ten times more data than all data systems are generating today.

The accompanying graph shows projections with the voice capability growing modestly at an annual rate of 2 percent and a data growth rate remaining the same (11 percent), as well as data traffic doubling every five years (annual growth of 14.9 percent) and data traffic tripling every five years (annual growth of 24.5 percent). The actual demand for growth and the resulting mix of data and voice could follow any one of the trends shown; but neither funds nor programs are approved for the next two years that would permit a growth of 24.5 percent a year. Therefore, the actual growth in terms of a voice/data mix is more likely to be within the bounds of the shaded areas shown. The range of structuring represented on the graph is so wide that more precise information is required

for valid planning and programming if we are to ensure that we are prepared to meet the needs and take advantage of the information age.

THE communications facilities of the DOD consist principally of communications links (circuits), switching centers for both voice and data (AUTOVON and AUTODIN), and terminal facilities. These facilities represent a total investment of about \$8 billion. Of these facilities, the links and switching centers will



How management systems can affect the relative percentage of voice and data composition in the usable channels of the Department of Defense Communications System (DCS).

be affected most by the above growth rates and patterns. Therefore, only the general impact on these services will be discussed.

data impact on communications links

Most AUTOVON users have made at least one telephone call when annoying conversations were heard in the background. Sometimes these background conversations are accompanied by static and a crackling sound. When either or both of these conditions exist, there is a quality problem on the circuit. When they are both present, it is generally an indication that the system is loaded beyond its designed capability—there is either too much traffic or an improper mix of voice and data traffic on the circuits that compose the communications link. Ordinarily, users can communicate under these circumstances because voice is inherently redundant and the users can anticipate each other. However, this reduced quality has a different effect on data: it causes errors. With narrative data, the messages you see every day, a certain number of errors can be tolerated, since you can read messages in which one or two characters in a sentence are misprinted.

Data required to support computerized management systems are random and require much higher accuracy than that required for messages; but virtually any error rate necessary can be provided in the system today—at a price. Error rates are a complex function of the speed and quality of the service. The error rate can be reduced by slowing down the transmission speed (bit rate) or by improvements to the transmission system, which are usually rather expensive. These factors should be kept in mind when speed of service and error rate requirements are established.

The largest growth of data service will be in the Continental United States (CONUS), where approximately 60 percent of the data traffic is distributed. Assuming all of the requirements are hard requirements, the solution of the communications link problem is a straightforward lease of commercial circuits. But even here, advance planning is required to ensure that adequate service is available.

To and from overseas areas, the problem is essentially the same except for vital communications. For the high-priority, most-vital systems, commercial circuits are used only when military systems of sufficient quality are not available or when a backup capability is required. Generally speaking, the need for high-quality military communications on the links to and from overseas areas already exceeds today's capabilities.

We have a different problem within and between foreign countries. For the most part, we have built military systems to meet our communications needs because of the poor quality of foreign systems and the requirement that a large part of the vital information traffic be under our military rather than foreign control. The new systems that we are now installing in Europe and the United Kingdom will have a capability for expansion to meet predicted needs by adding ancillary equipment, but many other systems in foreign countries were not designed for growth or have since been filled to capacity. Systems that were installed as recently as four years ago have limited growth, and some are already being expanded. However, the ability to expand military radio systems in foreign countries is not limited only by economics and technical capabilities; there are practical limits on the frequencies available to accomplish these expansions. In some areas no additional frequencies are available; and in that event new systems that operate in relatively uncrowded frequency bands, such as communications satellite systems, will have to be used.

It is important to emphasize that the system did not evolve with planned obsolescence in mind. It has only been recently that equipment was available to meet both the voice and rigid data standards of the DCA. In general, the links designed and installed to meet these standards still have growth potential and can readily be adapted to expanding requirements, if frequencies are available. Also, there has been a general reluctance to approve systems with a built-in expansion capability unless used on firmly stated future requirements, and there has been much debate about the validity of forecasted needs. Significantly, it

is often possible to install a system that can be doubled in capability for less than a ten percent increase in cost at the time of initial installation. However, once a system is engineered, installed, and becomes saturated, new capabilities are extremely costly.

impact on the switching systems

In the switching area, our dominant philosophy has been to design the system so that circuits are shared with other users. In AUTODIN this is accomplished by a store and forward process where the information is received in the switch and stored until a line to the customer can accept the traffic. This type of service may be adequate for accessing some of our support management systems, but it certainly will not be adequate to meet the real-time requirements of command control or many of the computer-to-computer requirements of our other management systems.

The circuit switch capability of AUTODIN in the CONUS provides a solution for this problem. It can provide a direct connection between users, including computers, and eliminate the delay involved in storing and queuing at the switch. Communications between them will be limited only by the speed which the connecting circuits will accommodate. Currently, this speed limitation is about 12,800 words per minute or 9600 data bits per second. Of course, higher speeds can be accomplished by using more than one circuit at a time. In this regard, only a very few of the 150 available circuit switch connections are in use today, and the switches have an additional expansion capability of 300 connections. Therefore, the circuit switch capability appears adequate to handle the projected loads for the next five years.

The overseas AUTODIN switches do not have a circuit switch capability. However, the data phone techniques could be used to meet this need. Here the connection is established by using AUTOVON and dialing the number assigned to a computer function or another user. Once the connection is made, the data equipment is switched on the line. Unless special lines are used, the system will not op-

erate at the high speeds associated with the AUTODIN circuit switch capability, but adequate service can be provided for users with relatively low speed requirements—100 to 600 words per minute.

The switched systems of the DCS show promise of being able to handle most of the information that we could reasonably expect the communications links connected to them to carry over the next decade. Therefore, because of cost benefits, they will be used to the maximum extent possible in meeting the requirements of the information age. If requirements exceed their capability, we must use circuits committed to the full-time use of one customer, but at increased cost and at a loss in the flexibility that is characteristic of the switched networks. From a practical standpoint, the limits to the expansion of data services may be set by the economic and frequency constraints on providing the communications links to meet the growing need.

what is being done

The Defense Communications Agency has the responsibility for master-planning the DCS to meet user needs. The people at DCA are busy looking at how they can adapt or evolve today's system to meet tomorrow's needs. As part of their effort, they are studying a wide range of alternatives to provide improved performance, including building an all-digital system or combining the current resources in the system that have quality and growth capability with a digital subsystem to form a hybrid system. This last alternative appears to be the most reasonable approach. As the accompanying graph indicates, voice probably will be the most used means of communication, at least for the next decade; and the hybrid approach permits adding data capabilities incrementally as resources and technology permit. Through this approach, the DCS will probably evolve into an all-digital system over the next twenty years or so. In the meantime technology is giving us a hedge

for this problem it created: the hedge is the Defense Satellite Communications System Phase II (DSCS Phase II), which operates in a frequency range that is not as restricted as that used in our other systems.

The DSCS Phase II will be initially deployed within the next few years. At first, only today's terminals will be used. As the capability develops, these old terminals as well as the new terminals to be deployed will be converted to use all-digital techniques. Within the next five years terminals will be deployed in the CONUS and all the key overseas locations; and if the digital part of the system is developed as expected, DSCS Phase II will be superimposed upon the present DCS as an all-digital subsystem, thus forming the first phase of the DCS hybrid improvements.

The first order of priority for DSCS Phase II will be to meet the unique and vital requirements of command control systems. Satellites uniquely qualify for the command control role by the high quality, survivability, and potentially high reliability features of the satellite system, coupled with its broad area of coverage and direct user-to-user capability. As a bonus, the DSCS Phase II system will have the capability of taking loads off conventional systems, particularly those requiring high-priority quality service. Thus the life of the marginal conventional systems will be extended. In addition, the satellite system will be able to provide worldwide high-quality, high-capacity service never before available in a military system. And there are many high-priority requirements of this nature awaiting this capability.

Significantly, the DSCS Phase II system will also have the capability to provide communications, both air-to-air and air-to-ground, to larger aircraft such as airborne command post and sensor aircraft of similar size. Technology and resource constraints will not allow us to use this system to extend command control communications to large numbers of aircraft such as the bomber fleet, the C-5As, or the smaller reconnaissance or fighter aircraft.



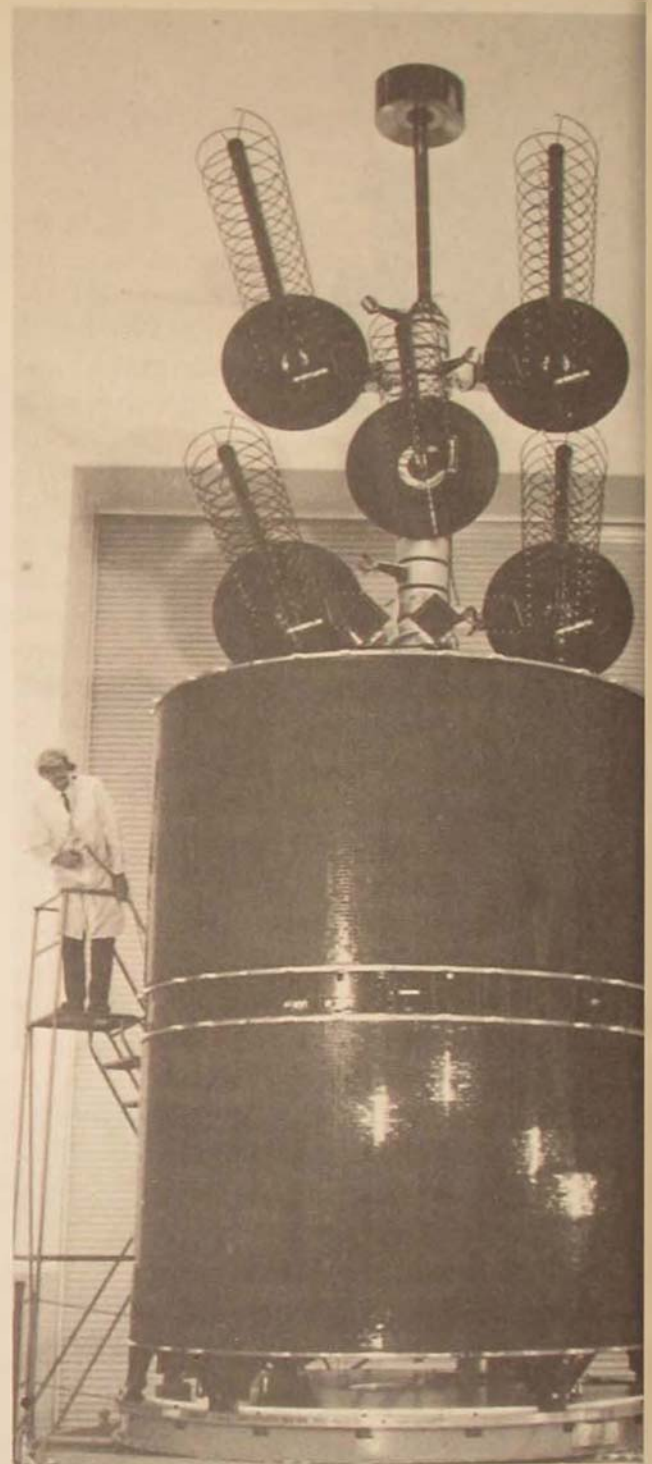
The UHF satellite capability, however, is particularly attractive as a reliable means of overcoming the shortcomings of the DCS Phase II system. The airborne terminals and antenna systems required for UHF satellite communications show promise of requiring little more space and weight than conventional systems now performing an equivalent function. Therefore, the next generation of communications satellites will require a combination of DCS Phase II and UHF capabilities.

The main advantages, then, of using communications satellites in command control systems are that they provide a much greater capability to meet high-speed data needs and will provide the capability of maintaining continuous command control to and from selected air weapon systems.

the strategic versus tactical problem

Up to this point, the discussion of the impact of the computer on communications has addressed only the DCS which provides strategic communications, but the impact on tactical communications is bound to be more profound. When the communications equipment needed to support our Tactical Air Control System was acquired, quality good enough for "around the corner" situations within a small tactical area was all that was required. Little thought was given to the requirement to communicate between the remote area and the CONUS. In part this was because high-frequency systems provided us with our only flexible, long-haul capability, and they had very limited capacity and quality. The extensive use of data communications was not foreseen, and the acceptance of the lower-grade "tactical" standards conveniently permitted the development of equipment that met both these and the mobility standards.

Today, the requirement for command control and other computer management systems is rapidly expanding for tactical support; the need for computer-managed systems is equally great for tactical operations as for strategic operations. Further, requirements are now well defined to extend these systems up through the DCS to Washington, Langley,



TACSAT, a Department of Defense experimental communications satellite, at 1600 pounds is the largest ever built, its launcher to be a Titan IIIC. It was designed to conduct tactical experiments for the Air Force, Army and Navy from a stationary orbit 22,300 miles above the earth, spin-stabilized, at 54 rpm, while the spin-wound helical antenna array remains pointed earthward.

Offutt, the Air Materiel Areas, and other locations in the CONUS, as well as to the intervening headquarters. Thus, the arbitrary line that has divided strategic from tactical is being blurred. In the near future, as data flow up and down the system, this arbitrary line will be marked only by ownership and the interface devices needed to interconnect between a high-quality DCS and the lower-quality tactical systems. In the long run, the quality needs of data traffic and the increasing demands for data will not tolerate an artificial boundary and its increasingly complex interface problem. Therefore, it is apparent that the next generation of tactical equipment must be designed to the same high quality standards that apply to the strategic systems. In addition, a more favorable balance between capability and mobility will have to be achieved.

THERE are significant social, economic, political, and military implications that concern our society in the new information age. This technological explosion will be felt in every stratum of business, science, industry, and government. The rapid growth of computers and their interrelations with communications systems are having and will continue to have a significant effect on mankind and his environment. In this article I have endeavored to trace the impact of the rapid technological growth by highlighting some specific examples of the changes already produced and the trends for further expansion.

The marriage of communications and computers that have time-sharing capabilities has greatly improved the flexibility of computer systems. Consequently, managers can readily see an evolution of new concepts and techniques that will enable them to improve operations and cut costs. Command control is evolving into a worldwide system that will link, on a real-time basis, information sources and decision-makers at essential levels of command. The provision of this capability should greatly enhance our ability to evaluate a wider range of options and assist in reducing the uncertainties in the decision-making process.

As noted, current trends are towards more automation and greater use of sophisticated machines to acquire, process, and analyze vast quantities of data. In the final analysis it is man himself who must make the decisions. Machines, however exotic, will only be tools for man to employ in the attainment of his objectives.

How well man achieves his objectives will be determined by how well he projects his needs. The growth of computerized management systems will impinge on communications—worldwide. The ever changing requirements will demand the ultimate in the planning and forecasting of reliable data upon which to design both machines and communications systems. The user of these systems must forecast his needs to the computer and communications planners. Only realistic forecasts will produce computer communications systems structured to meet the user's needs.

It is evident that many of our communications systems overseas require improvement or replacement if they are to carry significant amounts of computer-generated data. The Defense Satellite Communications System is ideal for meeting some of the sophisticated requirements for command control. It will provide the first step in achieving a hybrid communications system that will eventually evolve into an all-digital system as requirements and resources dictate.

A UHF capability is required to extend command control to selected types of aircraft. This requirement could be provided by marrying the DSCS Phase II capability with a UHF capability.

The new data-handling requirements of the improved management systems will have a profound effect on tactical communications. The requirements for data will not recognize the arbitrary line of demarcation that now exists between tactical and strategic systems.

Consequently, this line is slowly dissolving, and we should now adjust our thinking in terms of "the system" rather than in terms of separate tactical and strategic systems.

Hq United States Air Force

AN APPLIED APPROACH FOR ENLIGHTENED MANAGERS

LIEUTENANT COLONEL
WILLIAM D. BATHURST



AIR FORCE professionals all recognize and accept the intrinsic wisdom of the following samples of published Air Force management policies:

The Air Force will maintain the most effective force possible, incorporating maximum efficiency and economy in all operations, consistent with planned objectives.

All Air Force commanders must insure effective management of human, material, and financial resources.

Air Force activities must use technical and scientific advancements wherever they are applicable.¹

Acknowledging management policies and applying them can be two different matters. An apparent impediment to good management performance is the ever tightening vise of resource limitations. Budgetary reductions can provide a convenient alibi to all but the enlightened manager. He accepts the challenge, recognizing that he must surmount the apparent impediments if he and his organization are to perform effectively.

In the business sector, competition for markets for goods and services predominates, making efficiency a prime factor in profit and loss. Even stronger competition exists within the Air Force: the competition for results. This competition dominates our operations. Truly great demands are being made at all levels for increased production and accomplishment without benefit of increased resources.

To meet the demand and beat the competition, the commander-manager must continually improve his operations. The enlightened manager is aware of the need to innovate, change, and adapt himself and his organization. He recognizes that the need for change is not an indication of inadequacies within the organization but rather is a normal condition of the operating environment.

To advise and assist managers in their quest for improvement, the Air Force is fortunate and unique among the services in having a management engineering function. Management Engineering Teams are located at most Air Force bases. In the manpower management process of developing manpower

determinants, management engineering has performed an important role. The manning standards and criteria developed by the USAF Management Engineering Program² have not only improved the distribution and utilization of personnel within the Air Force but have also served to defend programs and resources in the budgetary process.

The role of the management engineer today is somewhat different from that to which many Air Force personnel were formerly accustomed. He is no longer simply a "standards setter" or "time and motion man," as he may have been viewed in the past. He has become a specialist in analyzing work, organization, and management processes; he is qualified and capable of assisting the manager in all phases of management. His education, training, and experience in the Management Engineering Program have provided him with considerable information and insight into Air Force operations and opportunities for improvement. His capabilities and the services he offers can be summed up in a definition of industrial engineering:

Industrial Engineering is concerned with the design, improvement, and installation of integrated systems of men, materials, and equipment. It draws upon specialized knowledge and skill in the mathematical, physical, and social sciences together with principles and methods of engineering analysis and design to specify, predict, and evaluate the results to be obtained from such systems.³

In a large number of corporations, the industrial or management engineer has become one of the more important specialists on the manager's staff. The reason is that the management engineer has the education, training, and experience which the manager needs to make the most effective use of his resources within the competitive environment in which he operates. The management engineer can identify areas in which change or redirection would be beneficial, determine what changes would be most effective, develop a program for installing or implementing the changes, and follow up to assess the effect on the organization. Such specialized management engineering services have gained widespread rec-

A management engineering technician and a maintenance superintendent discuss rearranging ramp parking areas for F-4s. The change resulted in greater safety, better access, smoother taxi flow. . . . Enlightened managers try to improve operations, whether in the office or on the flight line.



ognition as an effective means for managing change in the organization.'

Many managers have realized that they can no longer handle all the technical aspects of the organization themselves because they lack the time to acquire sufficient expertise in all areas. Instead, they extend their management ability by relying on specialists to handle details. Similarly, the enlightened manager uses management engineering specialists to manage improvement—an applied approach.

WHAT can the commander or manager expect from applying management engineering?

First, he can expect competence. The Air Force management engineer is educated and trained in the concepts and practices of industrial engineering. He has at his disposal a wide range of "tools of the trade." Among these tools are the well-known but perhaps little (or mis-) understood techniques of operations research, systems analysis, organizational analy-



sis, work measurement, linear responsibility charting, and flow process analysis, to name but a few. These tools are available to anyone who knows how and cares to apply them. The competent use of these tools to assist management is the management engineer's business. Many management engineering officers possess advanced degrees, are registered professional engineers, and participate in engineering societies such as the American Institute of Industrial Engineers.

Second, the commander or manager can expect confidence. Acting as a consultant, the management engineer provides recommendations for the commander or manager, not for higher headquarters or the Management Engineering Program. The manager accepts or rejects recommendations as he sees fit, is responsible for implementation, and receives credit for all benefits deriving from his actions. The consultant's role is to provide him with recommendations for action and assist him in implementing those recommendations. The preservation of the client-consultant relationship is an important element of the management engineering services concept.

Third, the commander or manager can expect objectivity. We sometimes overlook the fact that everyone's perception is affected by the environment to which he is accustomed. Thus, an individual tends to view problems and possible solutions in terms of the method of operation he usually employs. The management engineer (ME) provides the benefit of looking at problems from a different viewpoint.

An example of this occurred with the introduction of a new all-weather fighter aircraft into a new unit. The aircraft arrived complete with manufacturer's manuals, recommended periodic maintenance cycles, and inspection routines between flights. In addition, another organization operating the same aircraft gave the benefit of its experience in operating the aircraft. Application of all this information would have required a squadron manning level far above that which could be supported from available personnel resources. The new operating unit, despite lengthy analysis of all its maintenance functions, was unable to reduce the number of personnel required to

maintain the aircraft to a supportable level.

Management engineering personnel who were called in to assist in solving the problem conducted film analyses of the turnaround cycle. The film dramatically showed management exactly what took place, who took part, and how long it all took, the critical factor being refueling time. A total of fourteen different technicians took part in the refueling operation, and much of their time was spent waiting for access to restricted work areas or for some event to take place. All these technicians could be proved to be required, by regulation, to perform certain tasks within their specialty. The ME's questioned the need for specialization to such a high degree that the regulations had to be so inflexible. They recommended changes in regulations, cross-training of certain of the technicians to perform other tasks, and a procedure for aircraft turnaround. Application of these recommendations resulted in reduction of the turnaround crew from fourteen to three technicians.

This example illustrates the value of an objective or "outside" view. The maintenance personnel were understandably accustomed to operating within a specified regulatory framework, while the management engineers, not limited by that framework, saw a solution outside it.

Fourth, the requester of a management advisory study should expect feasible recommendations. Suffice it to say that recommending solutions requiring a disproportionate amount of additional resources or additional study is incompatible with the applied approach to management. Managers must be results-oriented.

Finally, the commander can expect full-time effort. Many managers believe that there are many problems they could resolve if they "only had the time." The management engineer can provide the continuous effort so vital to the solution of management problems, because that is his function.

THE commander should hold to these expectations in applying management



Applied management engineering improves maintenance methods, thus enhancing USAF aerospace capability.

engineering. Similarly, the management engineer has a few needs that must be fulfilled in order for him to provide effective consulting services. One of these is a thorough understanding of the structure, work processes, and communications network of the organization under consideration. Where possible, the manager should attempt to identify in general terms what his objectives are and what improvements he would like implemented. There have been cases where the commander called in a Management Engineering Team to determine if any improvements in operations or organization could be made. He had no specific problem in mind. He simply recognized the need for constant improvement and refinement and the value of applying management engineering in accomplishing his mission.

Additionally, the Management Engineering Team needs the cooperation of all members of the organization under study. In fact, it is beneficial if the members can participate

in performing the study and developing the recommendations. The members of the organization are not likely to place much value in the study or its results unless they have the opportunity to invest some time and effort in it themselves. This means they should have a thorough understanding of the purpose of the study and, wherever possible, should participate in the development of recommendations.

Combining the expertise of the management consultant and the functional expertise and experience of organization personnel usually results in much better recommendations than either can develop alone. The team acts as a catalyst to surface good ideas and develop them into feasible solutions. Furthermore, the problem of resistance to change can be greatly reduced in this way.

The USAF Management Engineering Program has been carefully building a true industrial-engineering/management-consultant capability through the selection and assignment of personnel who possess the necessary educational background and interest and then further develop their talent with technical training and varied management engineering experience. As a result, the Management Engineering Program meets the needs of commanders and managers at all levels for management engineering services—the applied approach for enlightened managers.

The U.S. Air Force is a product of change; innovation is one of its distinctive characteristics. The growth of its managerial leadership reflects the capacity of its members to prepare for and to encourage—in fact to dominate—change. The full participation of those who cherish Air Force traditions and yet are able to muster the necessary talent and will to make them better is the best guarantee for applied management to be effective in the complex aerospace age.

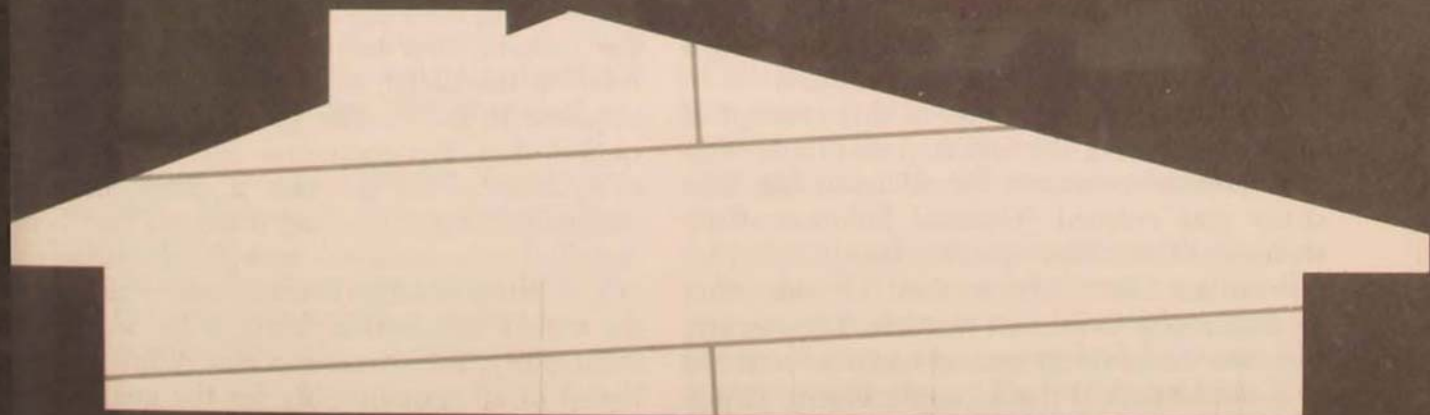
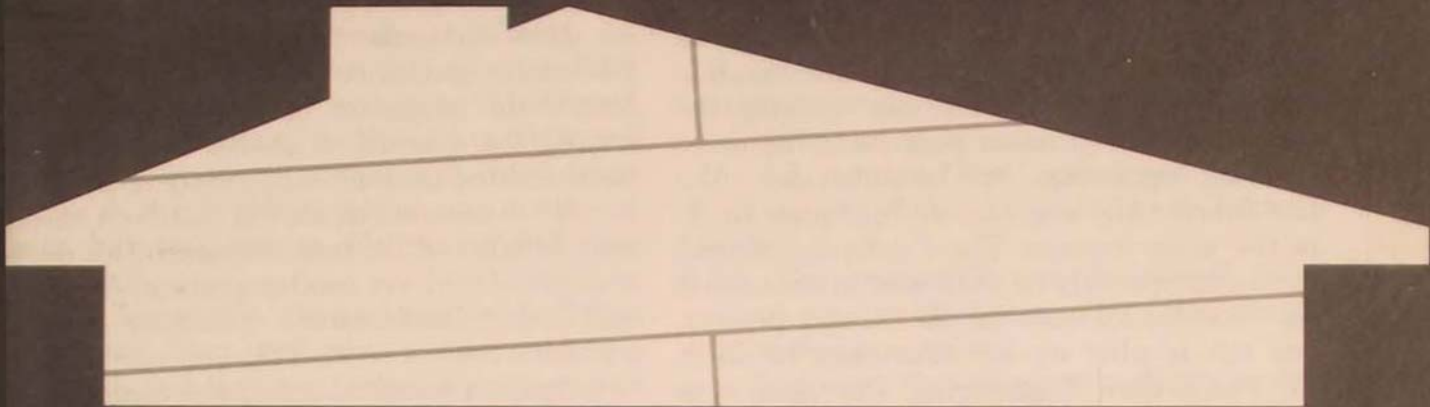
Hq United States Air Force

Notes

1. AFM 25-1, USAF Management Process.
2. AFR 25-1, USAF Management Engineering Program.
3. American Institute of Industrial Engineers.
4. Alex W. Rathe and Frank M. Gryna, *Applying Industrial Engineering to Management Problems*, AMA Research Study 97 (New York: American Management Association, 1969).

LIFE CYCLE COST— FACILITY APPLICATION

LIEUTENANT COLONEL C. W. LAMB



THOSE of us involved with government facilities often forget that as clients dealing in real estate we are the designer, constructor, owner, occupant, and to a limited degree the disposers of all real property. This means that we live with our own end products and that decisions made during the design and construction phases not only determine initial cost of construction but also directly affect expenditures required during the owner-occupant phase. Regardless of when the expenditure occurs, we are responsible for spending government funds. Yet all too often we tend to divide this responsibility into two distinct and separate entities, one covering the design and construction phase and the other covering operations and maintenance. We also functionally organize and program funds in the same manner. These activities should more appropriately be combined to insure that we consider all costs in the design process, and this is what we are attempting to do in Air Force Civil Engineering. Our goal is to insure that during the design phase we consider total life cycle cost as we strive to maximize construction quality and minimize cost.

Really the concept of total cost is not new. We have all sometimes had occasion to emphasize and implement total cost procedures. What is "total cost"? It is simply the sum of initial cost, lifetime operations cost, and lifetime maintenance cost. We need a common base for evaluation so that future operations and maintenance costs must be converted into present worth at current dollar values, added to initial cost and referred to as the life cycle cost. Although this article will deal primarily with our experience to date in military family housing, the concepts are applicable to all types of facilities.

Before implementation of this concept of life cycle costing, the first step was to develop a theoretical economic feasibility study. The study was entitled "Optimal Solution: Construction Cost Plus Maintenance Cost Plus Operations Cost." The method of converting all future cost to present worth and converting this into the uniform annual cost was reduced to a mathematical model applicable to family housing programs.

The next step was to develop a method to implement this theory. A method had to be established for awarding construction-type contracts on the basis of evaluating bids in terms of life cycle cost. This was a most critical phase. It was the key to assuring that if the government was willing to award contracts on a basis other than low initial bid and pay for improved products, industry would be required to reciprocate by improving its guarantees and standing behind its products with dollars, not just sales pitch.

How to make the manufacturer stand behind his guarantee was the next question. Should the contractor be responsible for enforcing the guarantee? Should the manufacturer and the contractor be jointly responsible for the guarantee, or should this be a direct responsibility of the manufacturer? This question introduced yet another problem—evaluating each manufacturer's guarantees on an equitable basis. The most obvious solution was to prepare a standard guarantee clause, state what specific items were to be covered by guarantee, and allow each manufacturer to state the period of time (in years) that he would guarantee his product. Thus the government assumes the prime lead in controlling and establishing types of guarantees.

Specifications were developed which required the manufacturer to furnish the contractor with his completed guarantee and be prepared to bond the guarantee in the amount of the bid item for his material if that bid proved to be the low evaluated bid; and required the contractor to furnish with his bid a certification, signed by the manufacturer, the bonding company, and the contractor, that the manufacturer could and would furnish a bond in the dollar amount of the bid item if required to do so. The specifications also required that the contractor receive, prior to completion of the contract, a statement from the manufacturer that the materials had been installed in accordance with the manufacturer's recommended procedures and to the manufacturer's satisfaction. Thus, if his work was satisfactory, the contractor was ultimately relieved of all responsibility for the guaranteed material, and the manufacturer became di-

rectly responsible to the government.

With theory and method of implementing resolved, we needed to test the procedures on some actual family housing projects. The type of project selected was for prefinished siding, since the product was controllable and several pending projects involved re-siding of family housing. The first project selected was at Loring AFB, Maine, with the bid opening in April 1968; the second was a Defense Construction Supply Center (DCSC) contract for procurement of siding for repair of houses damaged by an earthquake at Misawa AB, Japan, with the bids opened in October 1968; the third was at Fairchild AFB, Washington, with the bid opening in November 1968; and the latest were the second and third increments of the re-siding project at Loring AFB, with bid openings in December 1968 and June 1969.

In lieu of the standard type of technical provisions, four prefinished siding materials were selected that were acceptable to us and would give us a controllable base for evaluation: prefinished hardboard, vinyl-aluminum overlaid plywood, polyvinyl chloride extruded, and prefinished polyvinyl fluoride on plywood. The standard manufacturer's specifications were used, with the type of guarantee required and the provision for bonding the guarantee inserted for each material. The type of guarantee desired for the prefinished siding pertained to color fade, surface coating, and substrate. For each of these items, the manufacturer was required to state the number of years he would guarantee his product. The following were significant items in the specifications:

1. During the period of guarantee, if siding proves defective through unsightly discoloration, mottling, or fading, the manufacturer will correct.
2. If during the guarantee the siding chips, dents, peels, blisters, or flakes, the manufacturer will correct.
3. If during the guarantee period deterioration of the substrate material renders the siding unserviceable, the manufacturer will correct.
4. The government reserves the right to

accept cash payment for labor cost with the manufacturer providing materials, or the manufacturer may be required to provide both labor and materials.

5. Misuse or neglect by the government or through acts of God void the manufacturer's guarantee.

6. The manufacturer will provide a written statement that the material is applied in accordance with his instructions.

7. The contractor will countersign and deliver the manufacturer's written guarantee to the government.

8. The contracting officer will inform the manufacturer in writing when guarantee period starts and ends.

9. All manufacturers' guarantees will be made a part of the Air Force Real Property records.

10. The guarantees will be bonded in an amount equal to the bid item by a firm acceptable to the government.

To insure that all parties clearly understood the procedures, we had to establish and describe in the bidding documents a standard method for the basis of award. The following standards were selected: The time period specified was 25 years. The government would anticipate future maintenance and repair costs based on the manufacturer's submitted guarantees as to color fading, costing, and substrate.

A five-year painting cycle would be used, starting at the end of the submitted guarantee period for color fading or coating guarantee, whichever was least, and complete replacement would be anticipated at the end of the substrate guarantee period. Future painting cost would be estimated by using a basic cost of \$0.06 per square foot, increasing 3 percent per year (not compounded). Replacement cost would be estimated by increasing the unit bid price by the same 3 percent procedure.

Our actual bid experience with the four siding projects was most interesting, since this was the first time to our knowledge that the life cycle cost procurement had been used by a government agency for facility projects. The experience gained from each bid opening was

reflected in succeeding procurements. Manufacturers also appeared to be involved in a learning process, as their individual bid responses continued to change with each opening. The competitiveness of the commercial market was a strong catalyst in this learning process. For example, declaring a bid non-responsive for failure to submit written guarantees accelerated industry's evaluation of its previous sales-pitch guarantee versus a realistic dollar-backed guarantee.

At the first bid opening at Loring in April 1968, bids were received on three types of products; however, those bids that were not accompanied by the required provision for bonding of the guarantee were declared non-responsive. Although only one bidder was finally considered acceptable, the fact that an award was made for a facility contract using life cycle cost procurement procedure was in itself a major breakthrough.

The response received to this invitation to bid proved to us that our concept was feasible and that contractors and manufacturers would respond to this method of procurement if required to do so.

Perhaps the most significant changes on the part of manufacturers were the steady increase in guarantee periods, changes to standard products, selection of contractors, and general increase in level of interest. A review of guarantees showed that one major manufacturer, who at first would not even submit a guarantee, subsequently changed to 10-year guarantee on color fade only and finally to 10 years on color fade and surface and 25 years on substrate. A second manufacturer voluntarily changed his 25-year guarantee on surface and substrate to 30 years at the same time the first manufacturer went to 25 years. The effects of competition were apparent, and we now expect at least 15 years on color fade and 30 years on surface and substrate.

Manufacturers also began to recognize deficiencies in their products which restricted their ability to bond their guarantees. As a result, one manufacturer withdrew one type of product from the market altogether and modified two others. Other manufacturers are

working closely with the coatings industry to improve both bonding qualities and color retention. Others are evaluating installation procedures and accessories as a result of inspecting contractors' work in the field. Certain manufacturers, whose products to date have not been able to meet technical requirements, are actively trying to improve both their own product and technical production standards within the industry.

In the past a manufacturer, basically, could sell to any prospective contractor and not be overly concerned with actual installation. However, now it is to his advantage to be more selective and insure that bonds and certificates are provided to reputable firms capable of properly installing his product.

In general, industry's interest in this type of procurement increases day by day. We anticipate that this interest could lead to a new concept in specifications. We could state the system required, define what components comprise the system, and let each manufacturer select his standard product that would best fulfill the requirements for our stated system. The manufacturer would be in a position to submit his quality-line product, knowing that the contract award would be determined on the basis of the life cycle cost rather than on initial low bid. For example, we are developing a roofing specification that defines the roof system, establishes the minimum acceptable performance criteria, and permits manufacturers to bid and bond their own system.

As stated earlier, we see unlimited application of this life cycle costing procedure. Why not design a whole housing project using life cycle costing concepts? This would open the design to an unlimited selection of materials, each component being evaluated on its own relative merits. Something of this magnitude would require a coding system and a computer program to evaluate all the materials involved. For a total design project the life cycle costing procedures could be applied during an early stage of design development and used as a *design tool* in selecting the materials to be specified. We envision a slate of materials, all of which are appropriate and

1003 (All Electric Utility System) - Exterior Electrical Distribution System - Street Side - Under Ground - Aluminum Conductors

CONSTRUCTION

MATERIAL	QUANTITY	INITIAL IN PLACE COST/LIVING UNIT
Poles & Hardware (Feeder Line)	Per /Living Unit	\$ 7.57
Overhead Conductors (Feeder Line)	Per /Living Unit	16.24
U.G. Conduit & Structures	Per /Living Unit	75.34
U.G. Conductors (Primary & Secondary)	Per /Living Unit	182.03
Pad Mount Transformers & Bases	Per /Living Unit	87.45
U.G. Services	Per /Living Unit	96.90
Totals		\$413.53

MAINTENANCE

Estimated maintenance is based on following:

- 5th year through 14th year 0.0052%/yr of initial in place cost
- 15th year through 24th year 0.0102%/yr of initial in place cost
- 25th year through 34th year 0.0152%/yr of initial in place cost
- 35th year through 40th year 0.0202%/yr of initial in place cost
- Replace and double size of transformers during 14th year.
(This will carry load growth through 40th year.)

OPERATIONAL COST

Operation cost is based on existing utility rate and estimated load growth (1%/yr KWH consumption and 3%/yr KW demand) Start W/KW/Living Unit = 2.56; KW Losses = .026766; KWH = 22,652.8892; KW Demand = 5.44; therefore 1st year Demand Charge = \$171.36 and KWH = \$113.47

ASSUMPTIONS

- 7200 Volt "Y" System
- 14 Secondary
- Design Limits
 - 3% Max. Sec. Voltage Drop
 - 5% Max. Voltage Flicker
 - Diversified Demand 6.4 KW/Living Unit
 - 22.5 AMP Compressor on A.C. Unit

YEAR	OPERATIONS (O)	MAINTENANCE (M)	TOTAL
1	285.95	0	285.95
2	292.24	0	292.24
3	298.69	0	298.69
4	310.93	0	310.93
5	317.90	2.07	319.97
6	325.05	2.07	327.12
7	332.39	2.07	334.46
8	339.93	2.07	342.00
9	347.66	2.07	349.73
10	355.62	2.07	357.69
11	363.78	2.07	365.85
12	372.16	2.07	374.23
13	380.77	2.07	382.84
14	389.61	63.06	452.67
15	398.69	4.14	402.83
16	408.02	4.14	412.16
17	417.60	4.14	421.74
18	427.44	4.14	431.58
19	437.55	4.14	441.69
20	447.94	4.14	452.08
21	458.60	4.14	462.74
22	469.56	4.14	473.70
23	480.82	4.14	484.96
24	492.40	4.14	496.54
25	504.29	6.20	510.49
26	516.50	6.20	522.70
27	529.06	6.20	535.26
28	541.97	6.20	548.17
29	555.22	6.20	561.42
30	568.86	6.20	575.06
31	582.86	6.20	589.06
32	597.26	6.20	603.46
33	612.06	6.20	618.26
34	627.26	6.20	633.46
35	642.90	8.27	651.17
36	658.98	8.27	667.25
37	675.50	8.27	683.77
38	692.49	8.27	700.76
39	709.95	8.27	718.22
40	727.90	8.27	736.17

F. P. COLE and ASSOCIATES, Architects and Engineers, A.I.A.

FY 70, 300-Unit Family Housing Project, Davis-Monthan AFB, Arizona

Design engineers prepare voluminous worksheets for computer computation and analysis of life cycle costs.

acceptable from an engineering viewpoint, being evaluated on the basis of life cycle cost. By use of a computer program, the combination of materials that would result in the least life cycle cost could be compared. This scheme could be most effective in a situation where there is a Congressional limitation on cost of construction such as we have on family housing. If we can prove by life cycle cost analysis that with an increase in initial construction money we can reduce future expenditures and actually spend less money during the life of the structure, Congress should be more receptive to changing such limitations. In anticipation of actual use of life cycle cost in a design concept, a second feasibility study, en-

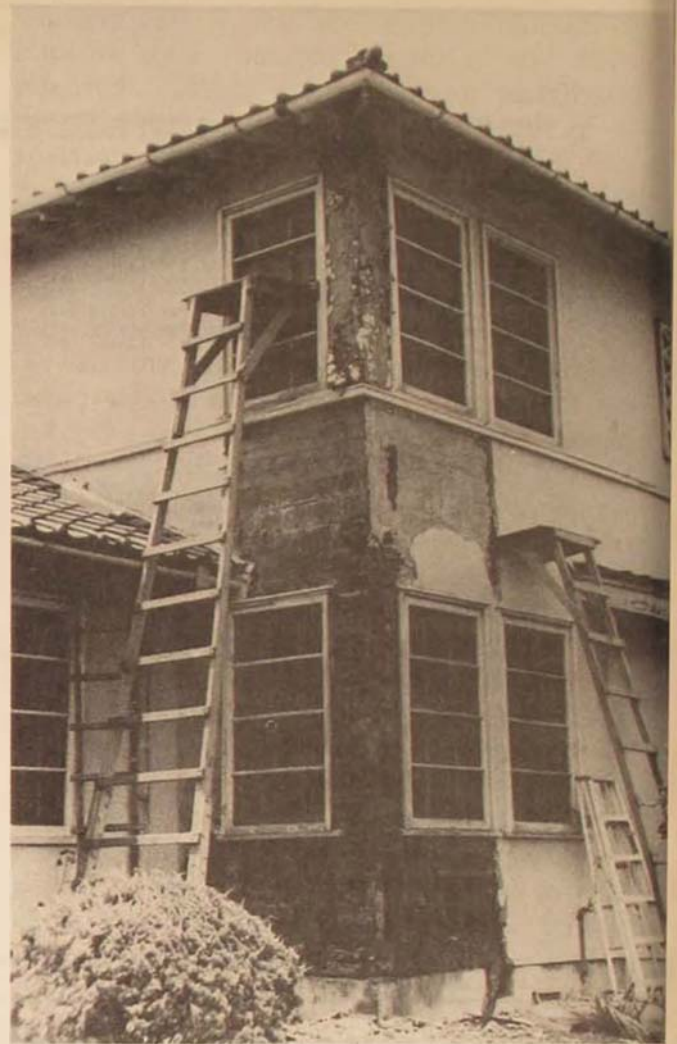
titled "Optimal Design," was developed, describing basic design procedures, housing component and material coding systems, sample computer program and logic for developing anticipated operation and maintenance costs. In support of the FY 70 military family housing program, we have authorized design of a 300-unit family housing project at Davis-Monthan AFB, Arizona, utilizing the concepts of life cycle cost. An architect-engineer has been hired, and the project is well into the design phase.

Review of one structural component will clearly demonstrate use of the life cycle cost during the design process. The following is a simplified analysis of various exterior wall

systems. The life cycle cost includes both maintenance cost and variable heating and cooling cost calculated for the specified coefficient of heat transfer.

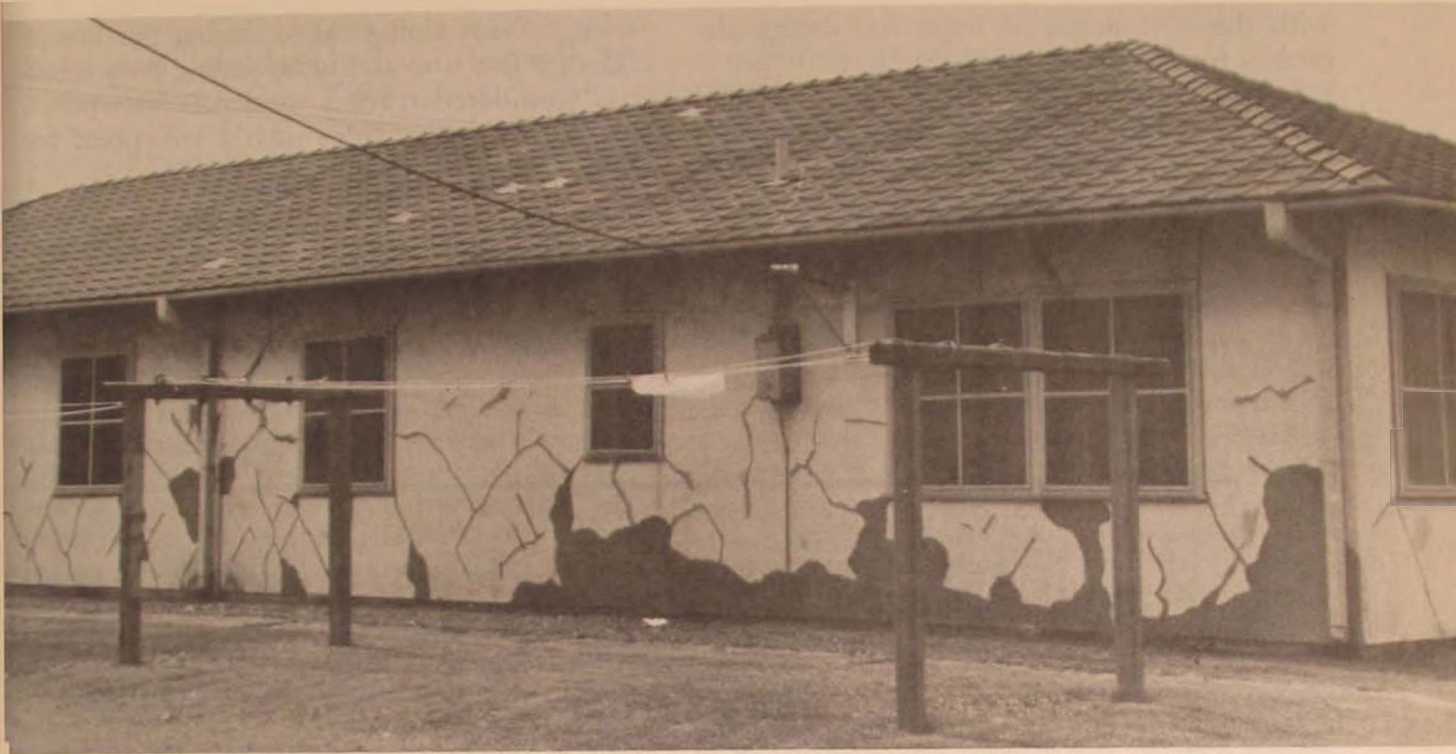
Type of Material	Coefficient of Heat Transfer	Initial Cost	Life Cycle Cost
Wood frame/brick veneer	$u=.10$	2540.13	2869.28
Wood frame/pref. siding	$u=.10$	1569.69	2048.59
Wood frame/field fin.siding	$u=.087$	1657.91	2289.86
Wood frame/stucco	$u=.11$	1384.71	1944.77
8" slump block—uninsulated	$u=.334$	1487.28	2221.64
8" slump block—insulated	$u=.10$	2343.67	2819.21
Concrete block w/stucco	$u=.51$	1748.62	2859.82
Load-bearing brick	$u=.10$	2954.47	3283.62

Thus it is readily apparent that wood frame with stucco would be the cheapest system, both initially and for the 40-year life of the structure. Conversely, load-bearing brick would be the most expensive. Since this is still the design phase, we are not limited to mandatory acceptance of the least-cost system or mandatory exclusion of the most expensive. Any system could be actually selected at this stage; however, the engineer making the decision and all review agencies not only would be aware of the cost implications but also would have immediate visibility of the detailed cost comparisons, both initial and long-range. This would be a most valuable tool in those areas where material is normally considered designer's choice or where a difference in engineering judgment exists. It also puts a price tag on pure aesthetic decisions, which are of significant import with design of any facility but particularly family housing. This



is a distinct advantage over conventional design procedures.

Analysis of the example also illustrates the fallacy of stereotyped criteria and/or decisions. In the past we have used a stringent standard coefficient of heat transfer of 0.05, which was later relaxed to 0.10. A comparison of uninsulated slump block (factor of 0.334) and insulated (factor of 0.10) clearly shows that the cost of improving the insulation qualities to an arbitrary standard would not be economically justifiable. Thus an incentive would exist which would stimulate designers to consider alternate solutions and eliminate stereotyped decisions. An acceptable solution from the example might be a combination of wood frame with stucco and uninsulated slump block. The slump block could act as



Maintenance and repair problems that afflict a typical American homeowner also besiege the Air Force, but on infinitely larger scale. The life cycle costing concept being implemented by Air Force Civil Engineering will maximize quality and minimize cost of military housing, and apply to other military construction, too.

both an aesthetic highlight and deterrent to damage in such areas as a carport.

The requirement for designers to estimate anticipated operation and maintenance costs does present special problems. One of the more significant is the availability and credibility of actual experience cost data, for both initial construction and operations and maintenance, in sufficient detail for application not only to a facility component but also to specific material selection within that component. After the architect-engineer for the Davis-Monthan project reviewed limited data available at both base and Headquarters USAF level, he found it necessary to contact local contractors, suppliers, and maintainers for additional information. An extensive data base is being compiled to support each life cycle cost

analysis for a specific facility component. This data base and learning curve should prove invaluable in design of future projects.

It is anticipated that this same type of data could prove invaluable during the construction phase. If construction fund limitations should become a problem, materials selected for negotiation could be considered in light of both initial savings and future operation and maintenance costs. This would greatly reduce the possibility of last-minute money decisions creating maintenance nightmares.

THERE is still a long way to go for full development and application of life cycle costing to facility design, construction, operation, and maintenance. Air Force Civil Engineering has assumed the initiative and taken a few small steps forward. Our progress is limited to family housing, and as yet we have not married the advantages of improved procurement procedures from our four re-siding projects

with the advantages of improved design decisions from our one design project.

The future is promising, and the total scope of application to all types of facilities is limited only by our own inability or failure to recognize the full potential of life cycle

costing. Every dollar saved during the life of a facility is a true and valid saving *only* when it is considered from a total cost viewpoint. Life cycle cost provides such a viewpoint for facility application.

Hq United States Air Force

To the Editor: The article, "An Examination of the 'Military Mind,'" by Colonel Thomas A. Fleek in the November-December 1969 issue of *Air University Review* has much interested me. I would like to reinforce his article and perhaps draw a conclusion or two myself.

I do not think anyone today can deny that the challenge to the military establishment from civilian critics is more serious than at any other time. It is well founded. In an age of criticism, particularly aimed at organizational authority, the military is receiving well-deserved scrutiny. The Air Force has been somewhat fortunate in that only two issues reached the public in 1969: that of cost overruns in the C-5A procurement and the axing of a management analyst in the Office of the Assistant Secretary of the Air Force. The Army has not fared so well, and the Navy has not escaped notice. The more highly publicized episodes, coupled with dissent from "rebel" soldiers at various military posts and their support from the "militant" peace movement, leave the Department of Defense somewhat defenseless.

The military needs more introspection. Colonel Fleek's words have illuminated the core of the problem; now I should think the Air Force, at least, would follow up on his article. Colonel Fleek clearly emphasized the schism between the ideal of the professional military and the *practice* of the professional military. It is this that is the root cause of the "violent profession's" troubles. I do not think it would take much thought to find

recent examples to bolster his statement: "Where the individual exercise of technological skill or general functional competence is concerned, . . . a strict insistence on such constraints [subordination, loyalty, duty, hierarchy, discipline and obedience'] and limitations may well have derogatory results." *Voilà*: Witness the events that led to the capture of the *Pueblo*. In my realm of operations and from my experiences, I can cite several lesser examples that not only give credence to but prove Colonel Fleek's words that "Not only can it [insistence on such constraints] inhibit creative thinking and effective operation; when the result is arbitrary decision-making, it can give rise to serious omission or error." In combat flying and in flying training I am daily faced with situations that are the result of too stratified and subordinated thinking.

I do not wish to say that the qualities of military "professionalism" are inadequate—rather, I say they are misplaced. Because of the Air Force management system, overcentralization of the decision-making powers has led to oversupervision, which *insists on* subordination and loyalty to ensure that its policies are carried out. I think that this is best described by Colonel Fleek's words: "An 'inward-oriented' tendency is further encouraged, if not forced, by hierarchial and corporate considerations and constraints. These include the *equating of rank with authority and decision-making responsibility, . . .*" (Italics mine.)

On the other hand the definition of military

operations necessitates those qualities of loyalty, devotion to duty, discipline, and obedience. That is the conflict Colonel Fleek speaks of. There is a grave difficulty in applying professionalism to an organization based upon hierarchy of command. It is even more difficult for the, *quote*, new generation of officer and airman, *unquote*, who have greater educational and intellectual backgrounds. The frustration is theirs.

Young men aspire to the principles of "dedication to public service" and to "'soldierly' virtues," yet the very environment in which they seek to fulfill these desires fails to reward or to encourage such energy. These are the young men who are to give the Air Force (and the other services) its more professional approach. Yet as often as they hear the word and are told to operate within a "professional" framework, the truth is that it is a façade. It is this frustration that I believe will be the seed of change to come.

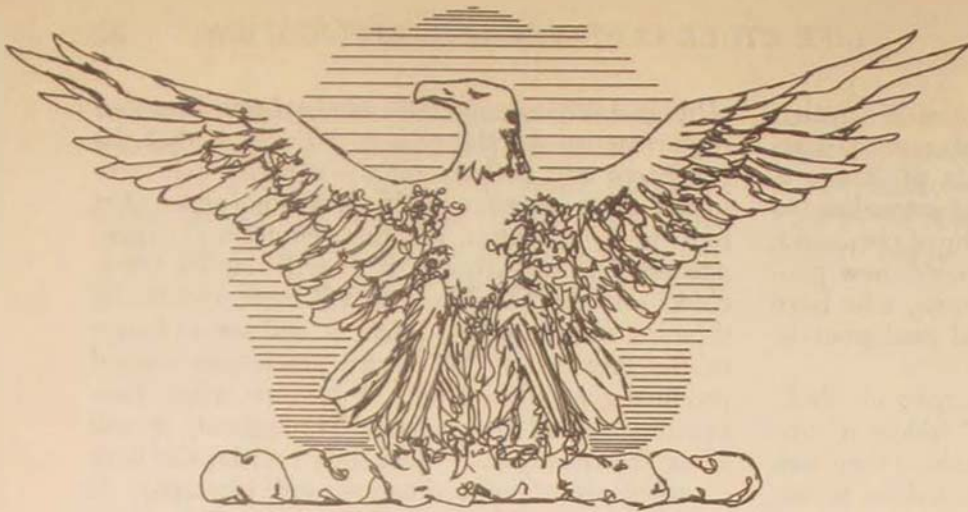
From my point of view, as time goes by, the Air Force will be undermined by growing criticism and from pressures to change. It will come from these very professional young men who were trained in specialized technical skills and emerged from broader educational backgrounds. I am certain it inevitably will "set in motion powerful and far-reaching influences that will ultimately affect not only the roles and duties of officers but perhaps the military structure." I would say that such Air Force traditions as automatic promotion, the officer effectiveness reporting system, basic organizational structure, and the timing and orientation of military schools will undergo radical changes. The "system" is going out of style because

of its inability to cope with modern pressures and requirements. All this means, I think, is that the Air Force and perhaps all the services will have to rely more on individual leadership (which that term really connotes, not the definition of "management" it has acquired). It will require fewer chiefs and more Indians. It will mean drastically thinning out the officer ranks. It will see a change in the mission of the service academies toward producing an elite group of leaders rather than broadly trained technicians. Throughout, it will allow the re-emphasis upon duty and loyalty with de-emphasis of subordination and hierarchy. It means ideas will be rewarded with opportunities to develop them. In short, it means a revamping of Air Force attitudes.

The dilemma will not be totally resolved because American virtues *are* directly opposite to military virtues. They need not be so polarized. It seems to me that with more *trust* of its subordinates the Air Force could gain much from the "civilian" virtues of self-reliance. (At present everything there is to do is guided and governed by a regulation or a directive.) If the Air Force changed its promotion system, initiative would again flourish, and ultimately (with performance being the criterion for joining the decision-making process) we might "resolve the present main sources of frustration and restraint."

So, in conclusion, the conditions of "creative anarchy" are soon to blossom—particularly as long as the Vietnam question continues to plague the nation. I think the 1970s will include a magnificent advancement in liberating the "military mind."

Randolph S. Reynolds
Captain, USAF



THE AIR FORCE AS A NATIONAL RESOURCE

DR. CURTIS W. TARR

AN OFFICER of the Air Force today has reason to recall his oath to support and defend the Constitution against all enemies, foreign or domestic. The latter part of that promise assumes new meaning in this, an age of change.

For nearly two centuries the American people have looked to the officers and men of the military services to protect United States

property and interests from attack by other nations (or in our earlier years the brigands of the Mediterranean). Throughout much of the nineteenth and twentieth centuries, America's geographic isolation provided a formidable barrier to attack, but as our business and social horizons extended, our interests abroad became more heavily involved. While World War II did not destroy the lingering hope

among some Americans for a retreat into a "Fortress America," it did confirm the virtual impossibility of doing so.

Since 1945 we have looked to our armed forces to maintain a state of readiness that would encourage peaceful settlement of difficulties as an alternative to the awesome futility of applying military force. On the threshold of a new decade, it becomes evident increasingly that members of our armed forces must be as creative in developing the means by which nations safely can defuse the potential of terror as they are in guaranteeing that vital national interests will not be lost in the bargaining process.

Possibly President Nixon had this role in mind when he responded in his press conference on 6 February 1969 to a question about establishing a Department of Peace. He replied that to create such an Executive Agency would derogate from the role of the Department of State and the Department of Defense. It is evident that the President then considered the armed forces as something more than a resource for making war.

However, the emphasis in the oath upon domestic enemies largely escapes consideration in the enumeration of the duties of our military men. It is true, of course, that the National Guard and less frequently the Army have been called upon to quell civil disturbances. Yet, except for the tragedy of the fratricidal Civil War, the dangers to our established government have come usually from without. Our enemies were foreign. But now, although our problems with foreign enemies continue or grow, we are threatened also by massive internal strife.

an expanded role for the armed forces

Aside from the reasons that precipitate rebellion among our poor, our minority groups, and our youth, it is evident that progress under the Constitution can hardly continue without a substantial national effort to correct some of this country's difficulties. One senses a national alarm demanding emergency action rather than a commitment of our resources in an orderly way.

In this milieu, the armed forces must find their new role. It is not sufficient to be content with work done well against the conventional dangers to which the nation was exposed throughout its history. We must respond, as other organizations have done and are doing, to the new revolutionary threats of the seventies. Fortunately the transition to this expanded challenge is made easier by the long familiarity of the armed forces with the amelioration of our country's problems and a contribution to her success.

The United States Army sent two young Infantry captains, Meriwether Lewis and William Clark, to explore the western fringes of the continent during President Jefferson's administration, a trip that transformed the American concept of nationhood. The Navy dispatched Commodore Matthew Perry in 1853 to pry open the doors of Japan to admit Western commerce. Five times Rear Admiral Richard E. Byrd journeyed to the Antarctic to make claims of territory and collect valuable evidence for scientists. In this same quest for knowledge, both the Navy and the Air Force support the efforts of the National Aeronautics and Space Administration (NASA) to explore space.

Nor have the armed forces confined their peaceful efforts merely to exploration. The United States Army Corps of Engineers has a long record of concern for public projects related to flood control and navigation. Dr. Walter Reed and several other Army doctors learned the secret for controlling yellow fever when they found the mosquito to be the carrier. Advances in the ability of men to communicate have depended often upon military needs prior to the time when commercial usage could bear the costs of development. The present effectiveness of air transportation, whether measured by the efficiency of airframes, communications equipment, or air traffic control, derives in a large part from the contributions of military aviation.

Thus the realization that the armed forces constitute a national resource is not new to the thinking of our nation's leaders. But the concept now has a new dimension for two reasons. First, the problems the nation faces

have a scale that demands the greatest contribution possible from every source of support. Second, we have reached the day when some of our military hardware, systems, and installations have become so costly that we must employ them whenever their use will be of significant assistance to society. It is in this new frame that I wish to explore the utilization of American military resources, particularly those of the Air Force. These promise to be helpful in opportunities for both direct and indirect assistance to the American people.

direct assistance

Although we have not organized our communications to report the efforts fully, the officers and men of the Air Force, and their wives and families as well, give continuing direct support to the causes that improve the communities in which we live. As I visit bases I receive comments frequently about the part that a sergeant has played in the organization of a Boy Scout troop, the leadership a young lieutenant has given to his church, the support of a captain and his wife to the Parent-Teacher Association, the workpower contributed by all ranks to the civic service clubs, chambers of commerce, lodges, and associations that undertake the wide array of projects seeking to provide a better existence for us all, particularly the less fortunate. These efforts have been and continue to be the foundation of social action in America, and it is impossible to measure the substantial contribution of Air Force men and women to the success of the efforts.

An enumeration of collective efforts by Air Force people is illustrative of another type of work being done. At Randolph Air Force Base, Texas, Air Force wives determined that many Mexican-American children were not ready for a public school experience, so they organized the Los Amigos Kindergarten to instruct preschool tots in English. The men of the Department of Weather Training at Chanhute AFB, Illinois, adopted deprived boys at a nearby home so that each resident could have an Air Force family for a sponsor. At Williams AFB, Arizona, men used their mili-

tary training to develop a civic disaster plan in the event of an accident at a newly constructed ammonia plant in the community. Veterinarians in Alaska have helped curb rabies through inspections of animal populations and inoculations.

base projects

At many Air Force bases, efforts have been focused into one particular project. Men from Robins AFB, Georgia, joined thousands of other citizens to participate in a massive one-day campaign to clean, restore, and paint parts of neglected Macon on the other side of the tracks. More than a thousand disadvantaged young people found employment in the summer of 1969 at Kelly AFB, Texas, where each temporary position was divided so that twice as many youths could work a 20-hour week. Similarly, Indian youths have found new hope through work and on-the-job training in western mountain states and Alaska.

Some imaginative work has been done at Tinker AFB, Oklahoma, where special attention has been given to the handicapped, particularly the mentally retarded. Too often these people reap the neglect of society and find themselves excluded from any chance for meaningful work. But at Tinker, jobs that do not require a high order of mental alertness are reserved for the mentally retarded. Thus far those given a chance have repaid the Air Force with their willingness to work and sense of responsibility. Furthermore, officials have learned that performance by the mentally retarded often is superior on dull or repetitive work, and thus the Air Force benefits as well as those employed.

The REC program at Offutt AFB, Nebraska, already is well known. REC has three elements: Recreation, Employment, and Counseling. Each year Mr. Pat Nelson, Director of Civilian Personnel, has developed more ambitious goals to help alleviate the distress in the Omaha ghetto. During 1969 about 2000 young people came to the base in buses for a week of athletics, good food, and orientation. Many of these also received counseling from Air Force people as well as hired counselors, most

of whom come from disadvantaged circumstances. These counselors usually have the option to continue working at Offutt for the remainder of the year on jobs where they can learn new skills; many of them also continue their formal education at the same time.

Hurricane Camille

Quite a different form of direct assistance results from the necessity for the rapid mobilization of resources during a natural disaster. In a calamity, the military services have the advantages of readiness and discipline. Too often emergency rescue operations falter because workers, while in abundance, do not know how to establish a workable command arrangement. My own experience in a California flood taught me that lesson under discouraging circumstances.

The nation called upon the Air Force and the Army during the earthquake disaster at Anchorage, Alaska, in 1964, and again during the Fairbanks flood in 1967. Often a similar call alerts some element of the force to assist during a forest fire, an earthquake, or a tornado. One such call came in August 1969, when it became evident that a hurricane, bearing the innocent name Camille, soon would strike the Biloxi-Gulfport area with an intensity seldom equaled. Keesler AFB, Mississippi, in the path of the storm, became the focal point of Air Force support operations.

Quickly officers and civil authorities drafted a support agreement. While hurried efforts were made to prepare the base to face the onslaught, about 4000 shelter spaces were offered to persons in the area. Because of these precautions, only those who refused to go into shelters lost their lives.

But after the storm passed, a massive effort was required to restore order to wrecked communities on the Gulf. Nearly 10,000 Air Force personnel assisted in the disaster operation, providing food, water, and clothing, furnishing communications, restoring utility and power services, cleaning up debris, rescuing casualties, furnishing medical and health assistance, and evacuating victims to hospitals where care could be given.

In the air, support was impressive. Air Force active and reserve crews and those of the Air National Guard flew 342 missions to airlift 3820 passengers and 3232 tons of cargo. They transported patients to hospitals in nearby states and brought medical teams from other parts of the country to assist in the emergency. Air Force crews also performed aerial spray operations to prevent the outbreak of disease.

Perhaps it is not reasonable to ask what would have been done without the Air Force during and after Hurricane Camille. But it is evident that Air Force resources saved many lives and alleviated much human suffering through rapid response and careful organization.

Further descriptions of the direct forms of assistance would serve only to make more varied and impressive the continuing effort. Much has been done, and more can be attempted. Doing so is the purpose of the domestic action program of the Air Force.

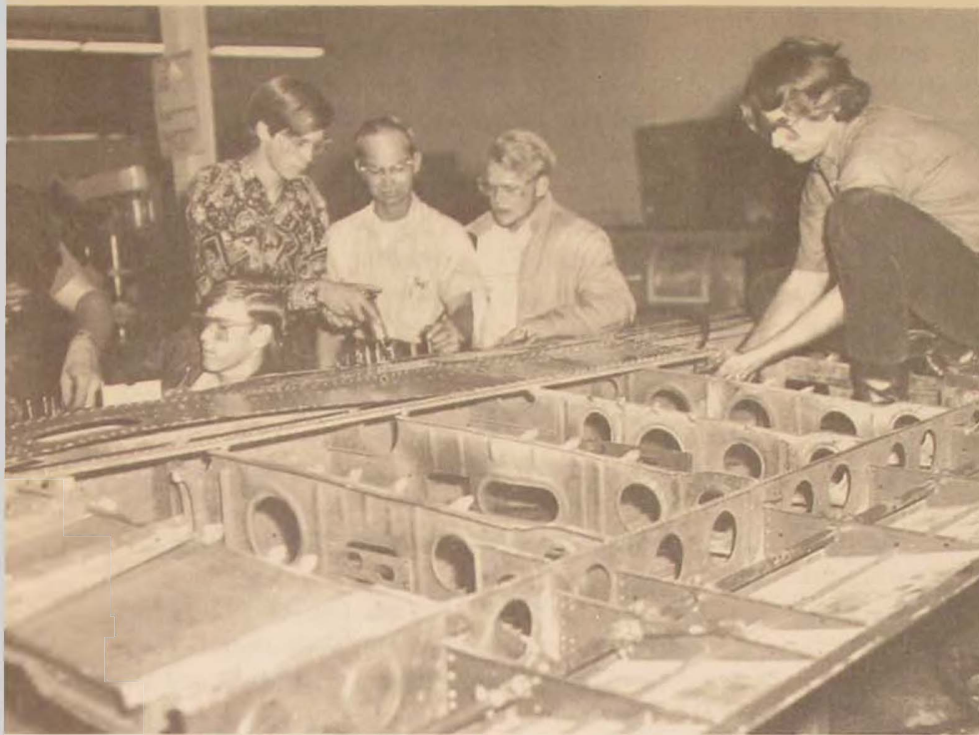
Now let us look at the forms of indirect assistance to society.

the Air Force as a synergist

For many years the work of the Air Force has produced unexpected dividends for the American people. This has been true particularly in research, education, and training. What we have learned often has value elsewhere if we work imaginatively and cooperatively to make it so. A few examples may illustrate the range of possibilities.

First, let us consider housing. Congress recently called for the construction of 26,000,000 homes within the next decade. It seems evident that we will not produce them with our present construction methods. It is odd that in America, where mass-production techniques received their start, we continue to be a backward nation in the construction of homes. Only in the mobile home have we utilized the technique we know so well.

Yet if one travels around the world, he finds numerous examples of Air Force modular construction; the Wakkanai Air Force Station on the northernmost tip of Japan pro-



At Sacramento Regional Occupation Center, McClellan AFB, California, high school seniors study sheetmetal, airframe, instruments and electronics, hydraulics, and electrical systems, acquiring skills at job entry level.

vides a good example. The Air Force builds schools and hospitals this way, erecting them on site in record time. The modules utilize standard parts and furnishings that can be purchased and installed with a minimum of relatively unskilled labor.

Perhaps an equally promising development is that at George AFB, California, where a portable-factory experiment has been conducted. This duplicates the efforts of certain European construction men to provide durable, inexpensive concrete housing. Officials of the Air Force have worked closely with the Department of Housing and Urban Development to expedite the transfer of knowledge to civilian practice.

We talk a great deal today about the deterioration of our environment. It seems evident to most Americans that no longer can we continue to expend natural resources without endangering the quality of life as well. Here again, the Air Force has done interesting work.

One might expect us to be involved in noise abatement. Actually we have undertaken

a pioneering effort to protect the human ear from noise damage. Also Air Force people have worked to determine how best to locate airports so that noise from traffic would have a minimal impact on populated areas. We have studied the effect of sonic booms on the populace. I suspect that the Air Force will be the leader to determine how to exceed the speed of sound with minimal production of offensive sound waves.

A great deal has been done on combustor smoke elimination. A few years ago, conditions in Vietnam required engines that would not produce smoke easily detected by the enemy. Experimentation produced fuel additives to reduce the smoke level and new combustor configurations incorporating advanced fuel atomization techniques, both of which have been effective. New generations of engines now utilize these improvements, reducing current air pollution in the vicinity of terminals and demonstrating the appearance of cleaner air that will help to restore public confidence and interest in a better environment.

The Air Force Avionics Laboratory has

begun a series of tests in its target signatures program, leasing to the University of Michigan a C-47 aircraft that has been instrumented by NASA for signature measurements. This equipment provides scientific information for such projects as wildlife surveys, data collection on waterway oil slicks, and shoreline studies. Ultimately the techniques developed from this effort may be useful for the analysis of water pollution problems and forest management, just as they will be for the detection of military targets.

Obviously in a research effort as extensive as that of the Air Force there will be many kinds of knowledge revealed that can help to transform our society. Some will be the direct result of our efforts to improve the Air Force. Many will be the by-product of a search for desiderata relevant to the improvement of our equipment, systems, or installations. In both cases we must learn better techniques for passing this knowledge directly to those who can use it for social improvements.

education and training

Possibly all else undertaken by the Air Force that directly or indirectly assists society pales when compared to our education and training programs. In these, we assist America in two ways: we train many young people who later take important jobs outside the Air Force; in doing so we learn something about the process of teaching that can assist in overcoming the problems facing educators.

The magnitude of the education and training effort is impressive. For instance, 694,290 young men and women of the Air Force completed some program of education or training during 1969. The programs varied in length from a few days to more than a year, and in cost from a few hundred to many thousands of dollars per person. If one multiplies the average length of each course by the number of participants, he finds that we provided about six million man-weeks of instruction in that year. This is the equivalent of having 14% of our force enrolled constantly in some organized program of instruction, and, of course, I have not included the practical training that



An Air Force volunteer, working at a Texas high school during off-duty time, counsels a student.

every man receives at his work as he gains increased proficiency on the assignment. Over 90% of the young men and women in the Air Force learn a skill that has some direct civilian utility. The economic effect of Air Force training was demonstrated recently when the commander of one of our technical schools received a letter from a businessman asking that an adjustment be made in the curriculum of a certain course so that the young men who take it might be better prepared for the work they do so well for his firm!

For many years, owing to a variety of circumstances, civilian educators have neglected vocational education in America, the means by which most of our people prepare for the important jobs that await them. The military

services have had to assume the responsibility for technical training, since recruits seldom have the skills they will need on their assigned jobs. Probably Congress would not support such training as a civilian effort, but the economy benefits when graduates are released from service to become members of a sophisticated workforce exploiting advanced technology.

The training establishment, preparing people to operate and repair equipment that changes frequently and using inexperienced instructors, has developed educational systems that attain results despite these limitations. Fortunately, humility is the advantage of military instructors; no vested interests or cherished lesson-plans inhibit progress.

Those who visit Air Force Technical Training Centers may be amazed at the effort in programmed instruction. Experiments to permit each person to advance at his own pace have proven their worth many times over. Recently the Air Force evaluated 46 of these prototype efforts. In them, the average gain in achievement over a test group taught by normal instruction methods was eleven percent. More important, programmed instruction reduced training time by a third. Imagine the consequences to America if we could transfer even a portion of this achievement to our educational programs everywhere.

In some measure vocational education falters when school systems fail to teach appropriate subjects or, if it teaches them, does so with material that is not relevant to the work for which the student is preparing. Recently officers of the Aerospace Education Foundation, an organization within the Air Force Association, decided to adapt Air Force materials and presentation techniques for public vocational systems. The climate seemed right for experimentation in the state of Utah. Careful preparation for the introduction of the material helped to guarantee acceptance by teachers and administrators. The first experimental groups already have completed testing, and thus far the program has produced encouraging results. In each case students in the experimental test group have mastered and retained the material better

than those in the control group using traditional materials. Instructors have preferred the Air Force materials; students generally have shown a similar preference. This may be the start of a substantial effort to utilize some of the teaching materials and techniques of the services to assist in the improvement of vocational education in the United States.

Computer-assisted instruction offers promise to both service and public schools if software can be perfected. I believe we are on the verge of substantial achievement in this endeavor. The preconditions exist for experimentation with computers in the Air Force: we have the numbers of students needing instruction to justify the rather high initial costs of the hardware and software. Much of our training is concentrated geographically so that experimentation is possible. We can extend easily our programmed instruction techniques to computer-assistance. This means of instruction permits flexibility in changing teaching materials. But most of all, it provides assistance to the individual at the time of difficulty: it is a way of showing, through machines, the personal interest that a classroom instructor usually is not available to provide. Ordinarily, the computer will not eliminate the need for instructors, but it will extend individual attention to men stationed in places where we cannot afford to send instructors. Thus we have high hopes for computer-assisted instruction. The dividend to society from our success will be substantial.

Project 100,000

It may be fitting to conclude these remarks about education with a description of Project 100,000. In October 1966 the Department of Defense embarked upon an experimental program to bring into the services young men who could not otherwise qualify, either because of some physical difficulty that could be corrected or because of an inability to achieve a score of thirty or more on the Armed Forces Qualification Test. For the first year, the department planned to accept 40,000; thereafter it set a quota of 100,000 for each year—hence the project name.

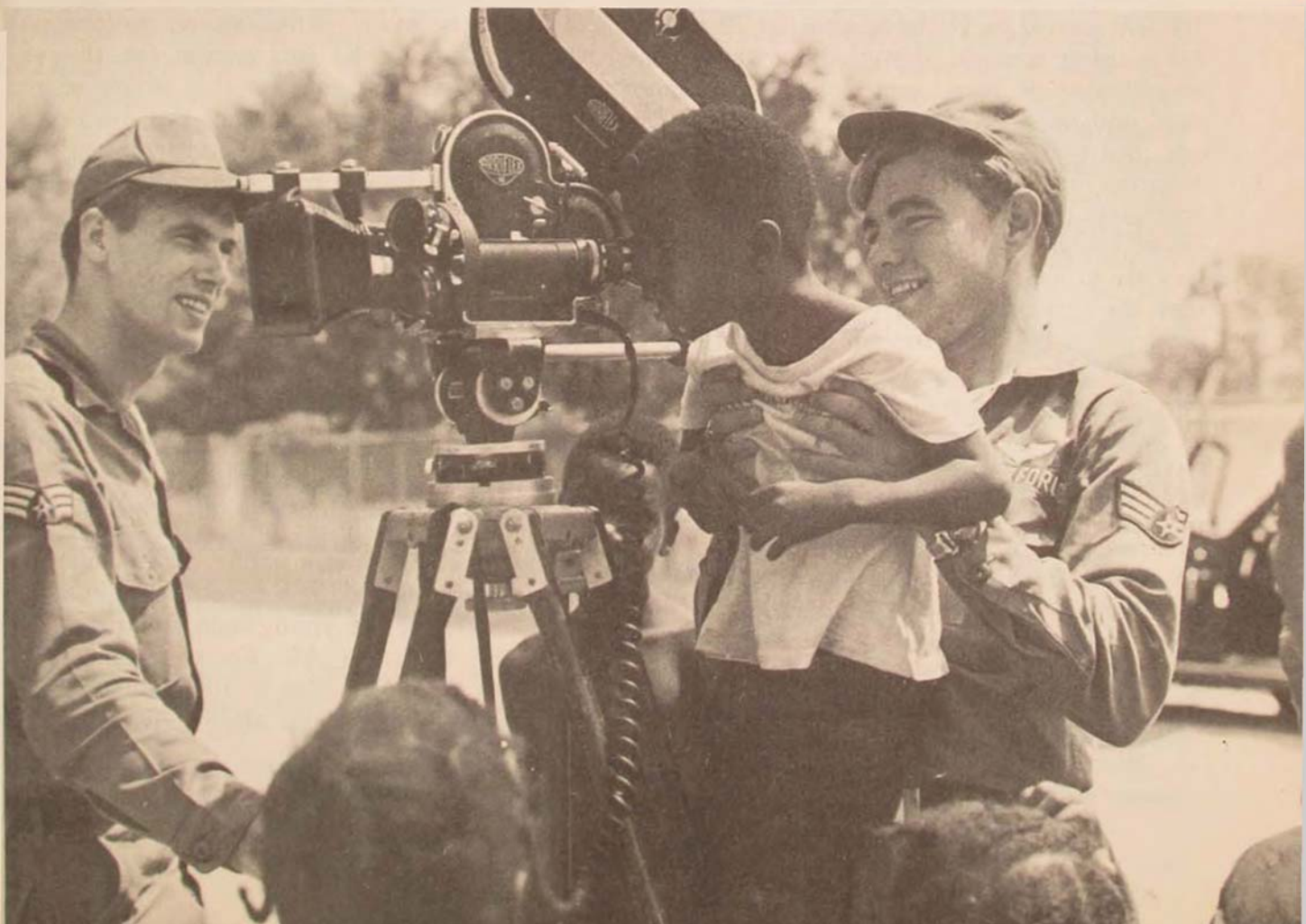


Cub Scouts proudly show the results of their handicraft projects, with their Air Force den leader looking on.



Airborne St. Nicholas delivers gifts to remote villages as part of Alaskan Air Command's Operation Santa Claus.

As an example of the USAF domestic action program, personnel of Robins AFB, Georgia, participated in Macon's "Spring Cleaning '69." While filming it for worldwide showing on the "Air Force Now" series, the sergeant takes time to introduce several eager young Maconites to his movie camera.



The Air Force, from October 1966 to the end of June 1969, accepted 45,472 under this program, somewhat over the goal set by the Department of Defense. Of this number, 18,660 were "New Standards Men," those with a score of 10 to 20 on the Armed Forces Qualification Test. Quite obviously progress in such a difficult undertaking cannot be easy: failures are expected. But these have not been an intolerable burden; by October 1969, 91% of the Project 100,000 men successfully completed basic training, compared to 97% of all others. And 11.3% of those enrolled in technical training were eliminated for academic or non-academic reasons compared to 5% for all other entrants. Out of the New Standards group, 7.5% received promotions to E-4 or higher, compared to 9.0% in a control group; 34.8% of the New Standards men qualified at a five-skill level while 41.4% in the control group did so.

But the point is that many men succeeded who prior to 1966 had no chance even to try. Of those who failed, most could be sent to another, less demanding course; Project 100,000 men thus far have gone to 70 technical training courses. Many have criticized the recruitment of men, some of whom cannot read and must be taught by expensive methods. But two arguments may be submitted in rebuttal. These men, in our society, already had been destined to fail—with all the consequent social and economic costs. If the services are successful in rehabilitating these men, then the services may have a valuable training proficiency that the nation cannot afford to overlook. In addition, of course, we may be moving to all-volunteer forces, or more nearly so than we are now, and in that competitive environment for manpower we will need the techniques we have already perfected for Project 100,000.

AS MY READERS have undoubtedly sensed, this is a plea to support a simple proposition: that the Air Force represents a national resource of considerable domestic value, in addition to its indispensable worth in protecting the nation from foreign attack.

We in the Air Force never can neglect our primary mission. Yet we live in a day when

our national security depends upon both protection against interference from without and preservation of stability within our boundaries. This is a lesson that we cannot forget.

Our view of the more complicated role given to us has great consequence to others in America who now may be looking at our budgets critically. Before further deep cuts are made into our capabilities, the public deserves to know the extent to which it is reliant upon the Air Force as a resource. For instance, heavy manpower cuts in one year could force us to close much of our training establishment; rebuilding it to some acceptable level of quality would require several years, to the substantial detriment of our military performance; dismantling the training establishment also would rob the United States of one year's graduates from technical schools in the military services, and no other sources for that training exist.

Furthermore, our attitude towards our new tasks influences the way we view ourselves. We are professional people in the highest sense, and the increasing complexity of our duties merely enhances our professional stature. It provides an avenue for the expression of social concern that many of us, particularly the young men of the Air Force, earnestly seek. For me, the orientation imposed by the times provides a welcome, exciting challenge.

Not long ago in Dayton, Ohio, I shared some of these ideas with officers assembled to mark the fiftieth anniversary of the founding of the Air Force Institute of Technology. Following the program, a young officer came to express his thanks in a unique way. He was a scientist, I learned later, with deep feelings of uneasiness about America's domestic problems. "If more men would talk as you have about the possibilities for service in the Air Force," he said, "more young officers like me would consider making a career commitment." As I looked at the young man, I formed the certainty that the Air Force—probably as much as anywhere else in the nation—needs him and others with his ability and devotion to a life of service.

Office of the Assistant Secretary of the Air Force



THE MIDDLE EAST OF THE 1970'S

AMBASSADOR G. FREDERICK REINHARDT

THE Middle East, when I went out there almost ten years ago, presented a picture in many respects quite different from that of today. Then Gamal Abdel Nasser enjoyed a position of almost unchallenged prominence and leadership in the Arab world. He was pursuing his policy of the so-called "Three Circles," which he had publicly described some years before in a small booklet. It was a policy which attributed to Egypt a threefold predestined responsibility of leadership: leadership in the Arab world, leadership in the Muslim world, and leadership in Africa. His success in these three different realms had, however, been quite uneven. The non-Arabic Islamic countries of Turkey, Iran, and Pakistan had not succumbed to his blandishments and had kept their distance. In middle Africa Nasser had developed somewhat more influence. He was backing Lumumba in the Congo, had close relations with Guinea and Ghana, and was causing trouble in Somalia. Cairo was full of African students, many living on Egypt's bounty.

Yet it was in the "Arab Circle" that the effects of his efforts were most apparent—and this despite the ironic fact that Egypt is the least Arab of the Arab lands, its population being 90 percent of Hamitic race. Be that as

it may, there was truly a Nasserite mystique abroad in the Arab world, and Nasser's photograph was to be found in shops and homes from Morocco on the Atlantic to the Persian Gulf.

Additionally, the picture ten years ago was one of a Middle East in the midst of a shift of great-power influence which involved the phasing out of the traditional positions of Britain and France, the new preponderant presence of the United States, and the beginning of Soviet participation. The Arab-Israeli conflict was in a period of relative quiescence. The Arabs were principally preoccupied with their own interrelationships and conflicts. Of these the most general was the defense of their respective regimes from the spreading influence of Nasser, who, having established in Egypt the first of the Arab nationalist-socialist revolutionary governments, having nationalized the Suez Canal and successfully defended against the efforts of the former colonial powers to retake it, was unquestionably the leading and most popular personality of the Arab world. Indeed, at his command, on occasion, all the conflicting elements could be merged into Arab solidarity.

The intervening years have seen much violence and change. In June of 1967 Israel won a six-day blitzkrieg against Egypt, Syria,

and Jordan. Israel ended up occupying all of the Sinai peninsula, all Jordanian territory on the west bank of the Jordan River, including the heights and city of Jerusalem and a piece of Syria around the strategic Golan Heights—all in all an area larger than Israel itself. The Soviet Union hastened to make up the staggering losses of military materiel on the Arab side, provided large numbers of teachers and advisers, and did its utmost to rehabilitate its clients and exploit its support of the Arab cause to the disadvantage of the West and of the United States in particular. There can be little doubt that the decade has seen an important accretion to Soviet influence in the area. The Soviet Mediterranean fleet, steadily augmented the last few years, is no longer an object of curiosity but is a military and political factor to be reckoned with.

The growth of Soviet influence and presence in the Middle East has been accompanied by a decrease of American influence. In fact, so successful has been the Soviet and Arab propaganda in reinforcing the identification of the United States with Israel that many Arab governments broke off diplomatic relations with the United States at the time of the six-day war, and they have yet to be re-established. Happily the Arab sense of self-interest was sufficiently alive in most places to permit, after relatively short interruptions, the continuation of petroleum company operations and the transit of American aircraft, but in the Arab world United States prestige and influence in general are at a new low.

Britain and France came through the period rather better, the former because it is still engaged in cutting back its presence in the area, and the latter because of General de Gaulle's shift of policy regarding Israel. Yet Britain's policy promises to provide new problems for the future. Having already abandoned Aden, her announced intention to withdraw from the Persian Gulf by 1971 will remove the last vestige of British protective military presence from the Arabian peninsula and expose Kuwait, Qatar, and Bahrain as well as the primitive and newly oil-rich sheikdoms of the Trucial Coast to a renewal of their local quarrels and to outside influences.

Important developments in the Arab countries themselves have changed the picture markedly. The decade has seen Libya join the oil-rich club; stimulated by the closure of the Suez Canal, her oil production by 1968 was equal to if not already greater than that of Kuwait. Algeria is increasing its oil production, and Egypt too is making progress in developing important sources of petroleum. It is the Libyan production, however, which has the most interesting implications—both because of its ever increasing quantity and because of its location well west of the Suez Canal and far from the troubled surroundings of Israel. How the new military regime in Libya will affect the picture remains to be seen.

Egypt has seriously damaged its own economy by blocking the Canal and keeping it closed, but she and Jordan succeeded in prevailing on their oil-rich Arab brethren of Saudi Arabia, Kuwait, Iraq, and Libya to compensate them for their losses arising out of the six-day war. The sum promised was between three and four hundred million dollars, but whether this subsidy will be followed by others is unknown. In any event, although strengthening their relative political position, it brings some impairment to the development plans of the donor countries and is the kind of contribution to Arab solidarity that requires repeated stimulation to be kept alive. This has been provided by the unfortunate burning of the Al-Aksa mosque in Israeli-occupied Jerusalem in August 1969 and the rising level

The Thomas D. White Lectures at Air University continued on 30 September 1969 when "The Middle East of the 1970s" was presented by Ambassador G. Frederick Reinhardt, now retired after a distinguished career in the U.S. Foreign Service. We are pleased to include an adaptation of his lecture in this issue of the Review.

THE EDITOR

of military activity in the Arab-Israeli confrontation.

Egypt had seemed to be making modest economic progress in the early sixties, but the increasing application of "Arab socialism" and decreasing foreign aid slowed this trend. The economic consequences of the latest war with Israel have been serious, as has been the nature of Israeli attacks and reprisals in the period following the official end of hostilities. Nasser still looms large in the Arab world, but less than previously. For the moment, at least, he is working closely with Hussein of Jordan rather than seeking his removal—an object he pursued periodically in the past.

Jordan, despite the loss of the west bank, made a good economic recovery following the war, with the help of Arab and other aid, but has recently encountered a setback. The guerrilla operations mounted from its territory against Israel have stimulated sharp reprisals. They have not only made the pursuit of agriculture along the frontier most difficult and dangerous but eventually led to the cutting of a vital irrigation canal.

Syria continues to entertain its unending series of coups and military regimes, which grow increasingly radical and unproductive. Iraq too has difficulty in achieving stability and continuity of administration, and the economy of the country has not benefitted. The new oil-rich sheikdoms of the Trucial Coast stand on the threshold of possible new prosperity, but it will depend on the decision of their rulers to spend the new income for public purposes and their ability to work out some interrelationship to fill the gap that will be caused by the withdrawal of British protection. King Faisal has brought better government to Saudi Arabia than his older brother was able to provide, and his administration is in the process of formulating a new five-year development program to be financed by oil revenues. Libya and Kuwait too are spending a considerable portion of their oil income on development programs, as is Iran.

At the moment, the political picture in the Middle East is almost the reverse of ten years ago and is characterized by the absence of serious inter-Arab conflicts and by a high

degree of tension in the present phase of the Arab-Israeli conflict, revived since the end of the six-day war by fighting along the Suez Canal and guerrilla operations and reprisals elsewhere. The trend toward a measure of reasonableness, which seemed to be reflected by Nasser and Hussein some months ago, has given way to the most belligerent utterances on the part of these two gentlemen, who are calling for renewed hostilities and destruction of the state of Israel. Libya has moved from the conservative to the radical Arab camp.

This sketchy comparison of the Middle East as it appeared ten years ago and as it appears today illustrates the three different sources of instability and spheres of confrontation, crisis, and conflict: (1) the rivalry of the great powers, now essentially limited to the super powers United States and Soviet Union; (2) the nature of the states of the area and their relationship with each other; and (3) the Arab-Israeli conflict. The interaction of these three factors increases the intensity and danger of the situation.

IF ONE LOOKS at the totality of countries that make up the Middle East, he finds that they fall into three broad categories: Arab Muslim, non-Arab Muslim, and the few that are neither Arab nor Muslim. The majority, some fourteen countries, belong to the first category; the two largest, Turkey and Iran, are in the second; Israel and Cyprus make up the third.

The Arabs themselves divide into three types of government: the revolutionary, including Egypt, Syria, Iraq, Yemen, Algeria, and now Libya; the conservative group, which has been reduced to Saudi Arabia, Jordan, Kuwait, Morocco, and the sheikdoms of the Arabian peninsula; and the neutral group apart, composed of Tunisia and Lebanon.

One of the principal elements of instability in the Arab world is the conflict between these conservative and revolutionary groupings of states. It is a conflict between the old and the new, between traditionalist monarchical states seeking to preserve their local cus-

toms and traditional Arab society and to achieve progress toward a more modern economy and society through evolutionary development on the one hand; and on the other, military revolutionary states bent on the quick and radical transformation of their countries along anticapitalist lines.

The two opposing groups are equally nationalistic, but the revolutionary camp is more anti-imperialistic and anti-Western. Anti-imperialism, once synonymous with anti-British, has now come to mean anti-Americanism. Ideologically, the anti-imperialistic group is pursuing a goal of Arab modernization and unity which, as postulated, can only be realized through eradication of all foreign (that is, Western) influence in the Arab lands and their modernization on a socialist pattern. As is the case with most governments elsewhere, its foreign policy tends to reflect its internal aspirations and objectives. This accounts for a certain bias in favor of the Soviet Union and socialist-oriented governments and a neutralist policy in great-power confrontations. For the conservatives the reverse holds true: their natural inclination is towards the West and America, and they reflect a more moderate attitude on international issues, including that of Israel.

In the mid-sixties the most serious conflict in the Arab world arose out of the civil war in the Yemen. There a new Imam, who as heir presumptive had been assiduously wooed by Nasser, was overthrown by a military coup the day after he assumed power. Nasser immediately moved to support his republican enemies. The Imam, who had succeeded in escaping to the mountains, waged active civil war with Saudi Arabian financial support. At one time there were some 60 or 70 thousand Egyptian troops in the little mountainous country, and Egyptian operations extended to bombing Saudi Arabian border points where reinforcements were passed to the Yemeni monarchists. The stationing of a U.S. Air Force training mission in Saudi Arabia at King Faisal's request was the move that put an end to Egyptian incursions over Saudi territory. Yet the confrontation between Egypt and Saudi Arabia kept those two countries at

dagger points for some four years.

Another recent conflict that seriously threatened the stability of the Middle East, albeit not one involving the Arabs, was the Cyprus issue. There the Greek majority of the population wanted union, known as *enosis*, with Greece. The Turkish minority would have none of it and demanded a fair participation in the government of an independent Cyprus or partition and union of their side with Turkey. The American efforts at maintaining a neutral attitude between Greece and Turkey in the long run probably contributed to the present truce between the opposing elements and the state of relative tranquility now prevailing. Yet this was obtained at the price of a shift in Turkish policy. Unhappy at United States refusal of full support of the Turkish position, the Turks began to question the value of United States guarantees against Communist aggression and modified their previous clear-cut position of anti-Communism to one which led them to respond to the new Soviet initiatives for more normal relationships between the two countries.

There are other intraregional disputes in the Middle East that periodically threaten the stability of the area, but none as persistent, long-lived, and serious as the Arab-Israeli conflict.

For more than twenty-one years the United Nations has been occupied with the issue of Palestine, Israel, and the Arabs. Several times it was involved in securing cease-fire and armistice following full-scale war. Almost continuously it has been involved in patrolling armistice lines and observing armistice violations and terrorist activities.

The passage of the years has revealed the difficulty, if not impossibility, of finding any basis for a settlement of this conflict, which periodically flares up into dangerous proportions and seems to worsen as the years go by. The root difficulty is that the two sides base their positions on diametrically opposite assertions. The Israelis base their claim to Palestine on its having been the land of their ancestors in ancient times. The Palestinian Arabs counter that they lived there for the last 1300 years until expelled in 1948. They

view the presence of Israel with its recent immigration as a last outpost of Western colonialism and consider it an inadmissible and unique anachronism at a time when everywhere else in the world self-determination and freedom from foreign domination are the accepted rule.

The dispute is a conflict of two ideologies, political Zionism and Arab nationalism. Zionists believe that a Jewish state is necessary for the preservation of world Jewry and that it must be established in Palestine as it was in ancient times. Opposing this is the aim of the Arab nationalists to secure the independence and unity of all Arab states. They contend that Palestine is an integral part of the Arab world.

Yet as a practical matter the state of Israel is now more than twenty years old, it is a thriving country, the most modern and progressive in the area, and a member of the United Nations. The Arabs for their part impaired their case against the existence of the state of Israel by concluding an armistice agreement with it in 1948 and not withdrawing from the United Nations when Israel was admitted to membership.

There have been times during these past two decades when it appeared that if only a satisfactory solution could be found to the problem of the almost one and a half million Palestinian refugees the biggest obstacle to a settlement would have been dealt with. But this requirement of the original provisional agreement was never accomplished either by return of the refugees to their homes in Israeli-held territory or by reparations and their resettlement elsewhere. And despite this there have been periods of relative tranquility until broken by the aggressive proclamations and actions of more radical groups in Egypt and Syria and among the Palestinian refugees. These have invariably led to Israeli reprisals, and in 1956 and 1967 to war.

American policy toward the Arab-Israeli conflict has had the virtue of consistency, but it has not been one to evoke the satisfaction of either side. The United States has sought to be even-handed and impartial, to work with the United Nations, and to spare no effort to

maintain the stability and peace of the area.

To this end, and in the hope of avoiding an arms race between the two parties, the United States together with Britain and France issued in 1950 the Tripartite Declaration. But this policy of self-imposed restraint in the sale of arms to the contestants broke down when the Russians made an arms deal with Egypt in 1955. Subsequent efforts to induce them to agree to a limitation of arms deliveries to the area have been unsuccessful.

In the effort to re-establish peace after the outbreak of war in 1967, President Johnson described our policy as based on five points. They are comprehensive, describe what has in fact been the essence of U.S. policy for the past twenty years, and demonstrate the American effort to achieve peace on a basis of impartiality. They are (1) recognition of the right of national existence, (2) justice for the Palestinian refugees, (3) innocent maritime passage, (4) limitation of the arms race, and (5) political independence and integrity for all. The United Nations resolution of November 1967 contains the essence of these principles and serves as the basis of Ambassador Gunnar Jarring's peacemaking efforts on behalf of the organization, which so far have been without results, as have several recent two- and four-power meetings.

No one can, I think, deny the impartiality and even-handedness of the American position, but events and propaganda tend to identify the United States with Israel. The Soviet Union in the United Nations and elsewhere has sought to exploit this identification so as to further its strategic purpose of undermining our position in the Middle East. The danger in the Soviet concentration of support on one side is that it tends to force the United States to the other side, thus creating out of the Arab-Israeli conflict a polarized Soviet-American situation.

Today oil looms large as a factor in Western and American interest in the Middle East. It is the principal source for both Western Europe and Japan. For the United States it is important strategically because it fuels our allies and incidentally the Sixth Fleet, and

it is important economically as a source of revenue. Although such estimates are never too accurate, experts put United States income and trade surplus from the Middle East and North Africa at something over two billion dollars. They put the total of net outflow of investment capital and foreign aid to the area at about half a billion dollars. That leaves a net inflow to the United States of more than one and a half billion dollars—not an insignificant figure in this era of balance-of-payments difficulties. The greatest part of this income from the Middle East is attributable to the oil industry.

THE Middle East in the years preceding 1967 had a general economic growth rate that compared favorably with that in other less developed regions of the world. It does not look as though this rate of growth will accelerate in the years immediately ahead. On the contrary, it may decline in areas of instability, as has been the case in Iraq and Syria. Jordan enjoyed a rapid expansion in the sixties, but this was cut off by the war in 1967.

In the more tranquil area of the Northern Tier, both Turkey and Iran are making substantial capital investments, and Iran has the favorable prospect of increasing oil revenues. Both countries are engaged in modernizing their agriculture and expanding their industry. So, too, in principle are the Arab countries, but here the picture is an uneven one. In the countries with large oil production, economic growth seems assured, given the probable continued expansion of oil production and barring other negative factors.

Algeria and Iraq among the oil producers are different. There, although oil is an important source of income, its share in the total overall revenues is less, and in these two countries recent experience in the other economic sectors has not been good. Iraq is patently a victim of political instability. Its fertile land and water resources are more than ample for its population, and together with the capital available from oil revenues they constitute a potential for significant growth

and development; yet these have not been the result.

Other Arab states with little or no oil have had an equally unsatisfactory experience. Political strife and war have disrupted their economies, and, lacking the domestic backup of large oil revenues, their economic prospects are the least promising in the area. Egypt continues to deprive itself of the revenues of the Suez Canal, although for the present the loss is being compensated for by subsidies from richer Arab countries.

Oil production and foreign aid are the key elements to development in the Middle East. If continued at roughly the present levels, the growth could proceed at a reasonable rate. Yet in the best of circumstances it will not be sufficient to bring stability to the area. There will presumably be improvements in the various aspects of national life, but for countries starting from such a low base, the growth rate cannot match that of the developed countries of the world. Accordingly, the gap between the two will increase, and the psychological problem of a sense of deprivation and unfulfilled hopes can be expected to continue.

Israel is, of course, a special case. Where as the average gross national product (GNP) per capita in the surrounding Arab lands is about \$200, in Israel it is almost \$1500. This extraordinary performance is a tribute to the ability, determination, and vigor of its people, but it is also a function of the great amount of financing received from supporters abroad—three billion dollars from the United States and almost two billion from West Germany, to mention only the major sources of this capital.

Although experts predict a possible slackening of the rate of increase of Middle Eastern oil production in the years ahead because of a slower acceleration of European oil consumption, it does not appear that the parameters suggested are such as to modify the basic picture appreciably. The demand for and consumption of Arab and Persian oil is expected to increase each year, and this despite the competition from rival producing areas.

The present outlook for any early opening of the Suez Canal is dim. In consequence the Canal will continue to lose significance as an international waterway. Projects are under way for an oil pipeline paralleling the Canal in Egypt and for one across Israel. The development of supertankers proceeds rapidly, and more and more oil is being produced west of the Canal. Thus the prospect is that, if reopened, the Canal will never regain its former importance as a principal channel for world petroleum. Its reopening will, however, bring significant relief to those European and Mediterranean economies having important trade relations with Asia and Australia. It will also be most useful to the Soviet Union for the access it gives to Southern Arabia, the Gulf of Persia, and beyond.

In brief, then, the economic prospects for the Middle East in the seventies would be reasonably good if the area could look forward to a period of general tranquility and absence of conflict. Yet this seems improbable. As it is, the potential is there, but the chances of performance remain uncertain, subject as they are to the depredations of political instability, strife, and the average 10 percent of GNP that the countries of the area devote to the purchase of arms and armaments.

It seems rather clearly established that the internal problems and conflicts of the Middle East do not lend themselves today to management or control from the outside. They can, of course, be modified marginally by the provision or refusal of arms and other assistance to one side or the other, but the basic quarrels are indigenous and deep-rooted.

They do vary greatly in importance and degree of threat to peace. The border states of the Northern Tier (with the exception of Pakistan) are a relatively tranquil area. Each is a more or less self-contained and integrated national society. Although their treaty relationships with the West and the United States have undergone some dilution and they have developed in recent years more normal and stable relationships with the Soviet Union, their basic orientation remains the same. Turkey and Iran appear to be moving toward a kind of buffer-zone status similar to that

occupied by Afghanistan. Each has its own problems which, in extreme manifestation, could upset the regime; but today these potential sources of instability would seem to be much less menacing than elsewhere in the Middle East.

The recent coup in Libya is an instructive example of how an Arab country can move overnight from the conservative to the revolutionary camp. With independence in 1951, Libya, a poor country of herders and farmers, was given little chance of survival because of its sparse population and almost total absence of resources. Without drawing undue attention to itself, it quietly and rather suddenly became one of the world's leading oil producers. King Idris, the head of the Senussi tribe, lived a retired life and followed a modest course, seeking to develop his country without incurring the envy of his neighbors. Rather frequent changes of ministries revealed that his internal political situation was not without strains and stresses, yet he seemed to cope with it well enough and to maintain the political equilibrium of his country despite the social pressures of the youth and the immigrants who were coming to his newly prosperous land. He appeared to have resolved some years ago the problem of succession to the throne by appointing his nephew heir apparent and by neutralizing other aspiring relatives.

His regime was rapidly acquiring economic strength, although it remained internally weak and the standard of living of the majority of Libyans did not reflect as yet the country's new wealth. The principal threat seemed to be from Egypt, which the king countered by a pro-Western orientation, which was also in the interest of the development of his petroleum resources. He accepted a British Army base at Benghazi in Cyrenaica and a U.S. Air Force base in Tripolitania and successfully resisted Arab pressure to have them removed. After the Arab-Israeli war of 1967, his position seemed to have been strengthened when he joined with King Faisal of Saudi Arabia in providing a large subsidy to save Egypt from economic disaster. A consequence of this was the termination of Egypt-

tian subversive activity in Libya.

As far as is known, Egypt was in fact not responsible for the coup against the king. It appears to have been carried out by an organization of Libyan officers on their own account, as happened in Iraq in 1958. Experts have observed that the initial public statements of the new Libyan revolutionary council contained Baathist slogans. Whether there are important links to the Baathist party in Damascus or to their enemies the Baathists of Baghdad, I have not learned.

Significant is the fact that Libya is the first of the oil-rich Arab countries to be taken over by a revolutionary socialist Arab military junta. This has effected an important shift in the balance of power in the Arab world. It presumably weakens the position of King Faisal and Saudi Arabia. Tunisia, which has sought to follow a moderate and neutral course between the conflicting Arab camps, now finds itself surrounded by radical regimes and must feel itself to be in a precarious position.

Although at first it was somewhat uncertain what the ultimate attitude of the new Libyan regime would be toward the British and U.S. military bases, they soon announced that the base agreements which expire in 1970 and 1971 would not be renewed and shortly thereafter demanded immediate evacuation. The future of the oil concessions is clouded. In the past, new Arab military regimes have more than once started off by making reassuring promises to foreign oil interests that they would remain unmolested, only with time to modify their approach and in some cases to nationalize the concessions. It is interesting to note, however, that at the time of the six-day war *Al Ahram*, the leading official Cairo newspaper, commented that those who proposed the nationalization of foreign oil concessions were proposing damage to the national economy. Of course this was said at a moment when Egypt had good reason to hope for an interesting increase in its oil production being developed by foreign concessionaires. Yet it may also have reflected a more sober appreciation of national economic interest. The precedents of Iran and Iraq should be

instructive, the former as to the importance of access to international markets and the latter regarding the magnitude of loss which experimentation with oil concessions can inflict on a national economy.

THE inherent instability of the Arab world is a phenomenon one can count on in the years ahead. As my successor in Cairo, John Badeau, a life-long student and authority on things Arabic has written: "Of only one thing can we be certain—that with or without the UAR and its President, the Arab world will be restless and unsettled, sometimes at strife with itself and with us, while its people strive to find their way through the maze which leads from a medieval to a modern future."

The Soviet Union has for some years now been following an active and aggressive policy in the Middle East. Ever since the Arabs' and, more important, Nasser's reaction to the Baghdad Pact opened the door to the Soviets' involvement in the area, this involvement has been steadily growing. It is roughly estimated that they have invested in the area more than \$5 billion in military and economic aid. The economic portion is believed to amount to about 40 percent of all Soviet economic aid to foreign countries. Since the Arab defeat in 1967 the military aid has included increasing numbers of military advisers and instructors. The Soviet Mediterranean fleet, which came into being following the Cuban crisis, has been steadily augmented and now enjoys the equivalent of base rights in Egyptian, Syrian, and possibly other Arab ports. Another consequence of the war which extended Russian influence in the area was the opportunity it offered the Russians to take the place of the Egyptian presence in the Yemen: a strategic point from which to extend Soviet influence in Southern Arabia in the direction of the Trucial Coast and the Persian Gulf.

These activities have been coupled with unambiguous support of the Arabs in their conflict with Israel. It is a policy which has served them well in increasing Arab hostility to the United States on the Israeli issue and

in reducing American influence in the area. The Soviets have not gone so far as to employ military intervention on behalf of their clients and are believed to have made some efforts to restrain the Egyptian moves which precipitated the 1967 war, but the speed with which they made up their friends' losses of arms and equipment was impressive. With the British due to leave the Persian Gulf in 1971, opportunity beckons farther east.

It is a fair surmise that the Israeli-Arab conflict will continue to provide the Soviet Union this convenient access to the Arab world, and new opportunities for further extensions of Soviet influence will present themselves.

The Soviet Union is bound to become more closely involved with Arab and Persian oil. Once a competitor in world markets, it is now, according to accumulating evidence, no longer in a position to export large quantities of oil to Western countries. Even the countries of the Eastern bloc are beginning to turn to the Middle East for oil, a development which runs athwart Moscow's efforts to tighten the economic interdependence of its satellites. It means that contrary to this policy the Eastern European countries will be able to buy oil more cheaply and have new opportunities to sell equipment and other products in a wider market. The Soviet Union itself has already concluded an agreement for the importation of Iranian natural gas. There are reports of Soviet purchase of Mideastern oil. This trend is liable to grow as the Soviet production of automobiles and trucks increases. The Soviet Union will then become as much a consumer as a competitor with respect to the oil of the region. Its political influence on the governments of some of the oil-producing countries is another factor in this picture.

Recent Soviet policy in the Middle East, though expensive, has generally been successful so far, and in the absence of overriding events elsewhere one must assume it will continue. The critical question seems to be one of degree: whether Moscow may feel tempted to raise the level of its effort in the hope of inflicting greater political defeats on the United States, setting its course toward a goal

of becoming the dominant power in the area; or whether, having come as far as it has, it will not push too hard and may even be open to some measure of cooperation with the United States in seeking peace and stability in the area.

There are no doubt many pressures for both these alternatives. Traditional Russian ambitions reaching southward, desire for enlarged security or buffer zones around Soviet territory, the ideological commitment to extend Soviet Communism, and the far-reaching impact such an expansion of Soviet influence would have on the world balance of power—all these would call for greater Soviet effort and pressure in the area.

Against such an extreme policy are equally important considerations. The first is, of course, the risk it would entail of head-on nuclear confrontation with the United States, possibly leading to nuclear war. Certainly the United States would not easily accept a developing situation which, apart from its implications for the Middle East, would threaten to outflank NATO and put in jeopardy the whole defensive system of Europe and the West. Other considerations are the increased burden on the Soviet economy which would accompany an all-out program tending toward complete responsibility for the area. Politically, too, one can see problems. The Soviet Union has been learning that it is increasingly difficult to control so-called fraternal regimes in Eastern Europe. Nationalist Arabs would, if anything, be more intractable. An Arab unity brought about under the umbrella of a Soviet-dominated Middle East could also have unwanted repercussions among the thirty-odd million Muslims of the Soviet Central Asian republics.

On the other hand, a less aggressive policy than the present one, although cheaper and presumably easier to run, would appear to have little attraction, other than that of a reopened Suez Canal, at a time when the present policy is proving to be so successful. Détente in the Middle East will probably become attractive to the Soviet Union, if ever, as a result of events elsewhere. A sharpening of the quarrel with Communist China or in-

ternal difficulties within the Soviet Union itself would seem to be the kind of development that could produce such an effect.

The conclusion, then, is that on balance one can expect Soviet policy for the time being to continue more or less along its present lines: exploiting the opportunities in the area but seeking (as in 1958-67) to avoid direct confrontation with the United States and agreeing (as they did in September 1969 in New York) to participate in efforts to put some restraints on the Arab-Israeli conflict, if only to keep it from escalating into a general catastrophe.

In the face of this Soviet activity, the United States has sought to preserve the basic elements of its policy of even-handedness in the pursuit of peace and stability for the area. Even-handedness is usually difficult in the presence of an adversary bent on pushing one aside. And so it has proven to be. Yet it was the United States that rearmed Jordan after the 1967 debacle. It has succeeded in maintaining relations with the conservative Arab regimes, although most of the radical regimes have yet to re-establish the broken diplomatic relations. But Egypt and Jordan presumably want to maintain contact with the United States for a variety of reasons. In the past they have depended to a great extent on American assistance and would benefit by its renewal. More immediately, as occupied countries they must value whatever influence the United States can exercise on Israel toward the withdrawal of the occupying forces.

The growth of the Soviet fleet has modified the balance of power in the Mediterranean, which is so far most apparent in the diplomatic arena and in Soviet ability to deny American naval units the use of certain ports. Of course that fleet does have the potential of a counter that could be interposed to shield Soviet clients in a situation where there might be a suggestion of United States military intervention. Or, as seems to be a fact today, it could shield Egypt's Mediterranean

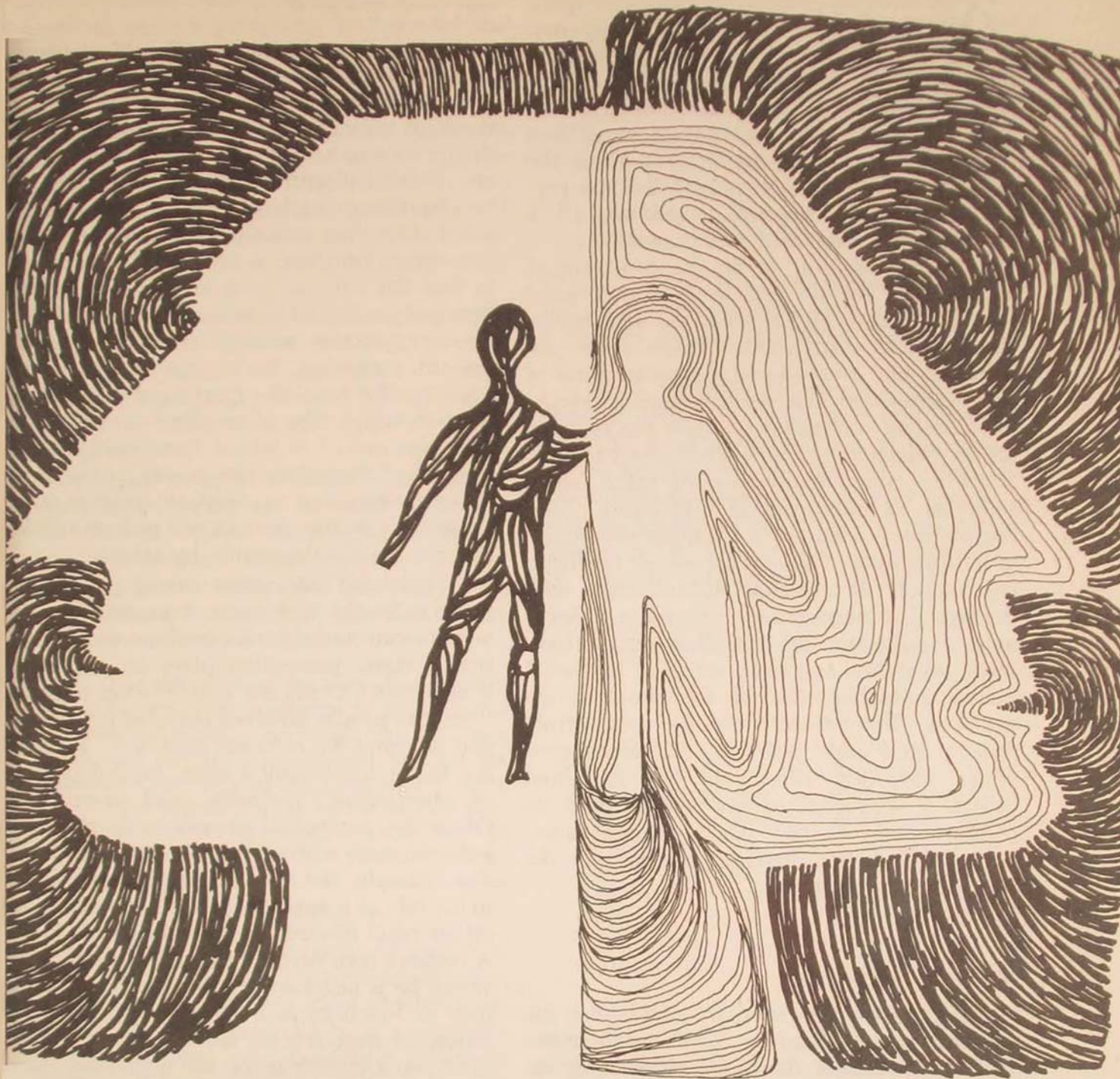
shore from possible Israeli strikes. Yet as a fighting force it is far inferior to the Sixth Fleet. It has none of the striking power and I understand is essentially defensive in its makeup. Its firepower and number of units have been compared to those of the Italian fleet.

What is the United States likely to do in this situation? Alternatives to its present policy have been suggested. It could shift to all-out, unequivocal support of Israel or, alternatively, to support for the Arabs. Yet each of these hypothetical possibilities is without reality for various reasons.

I would suggest that the United States will continue as in the past to work both in and out of the United Nations for the settlement of the Arab-Israeli conflict if possible and at least for its containment. It will cultivate as best it can both conservative and radical Arabs and seek to reduce their hostility and assist them where possible on the road to development. The absence of diplomatic relations with certain of these governments is not of itself an absolute barrier to progress. Ours is a very diverse society, and our impact abroad is anything but limited to official channels and actions. At the same time I would assume that the deterioration of our position in the Mediterranean would impel the government to give renewed attention to the Northern Tier, Turkey and Iran, and to keep our fences mended in that strategic area. It might also consider augmenting our naval presence in the Persian Gulf.

This picture of the Middle East in the years immediately ahead is not a particularly encouraging prospect. Yet would it not be unrealistic to pin one's hopes on an improbable miracle? There is no more complex area today than the Middle East, and the elements that make up that complexity are a fair guarantee that instability and strife and the confrontation of the super powers will continue to prevail in that part of the world for some time to come.

Zurich, Switzerland



SOME INTERPERSONAL ASPECTS OF NEGOTIATIONS

LIEUTENANT COLONEL VICTOR F. PHILLIPS, JR.

ALL Air Force officers in today's complex, interdependent organizational environments continually engage in negotiations, that is, in formal or informal interpersonal, interactive exchanges aimed at the mutually satisfactory resolution of some form of potential or actual conflict. To stress the *interpersonal* factor, let me recall some psychological aspects of people which may affect our everyday lives and which could have a very significant bearing on the processes of negotiation. We do not leave our personal feelings, biases, and beliefs at the door before entering into negotiations. These sometimes nebulous but ever present pervasive parts of our psychosocial makeup can have a definite influence on our behavior, how we react to others' behavior, and how others react to ours.

I will not attempt to offer quick, clean solutions to interpersonal differences. Each negotiation procedure is a unique experience in its own right. To superimpose an unchanging template of personal characteristics over the model of negotiations is to invite a mechanistic, dogmatic solution that would have little reliability and less validity. Rather, I believe it is important to be aware of the problem. The problem is that we are not truly rational and that psychological forces exist which definitely affect our feelings about others. If we recognize this problem and are aware of some of these innate characteristics, we may be better prepared to approach the negotiation process.

physical surroundings

Relatively little need be said about the physical surroundings in which negotiations take place *unless* there are distracting extremes in such variables as noise, lighting, ringing telephones, air hammers, and the like or even in persistent coughing, smoke-filled rooms, etc. Where possible, of course, physical conditions should be made conducive to unhampered interaction, although they appear (except at extremes) to play a lesser role in negotiations than do such less tangible factors as the psychosocial.

psychological aspects

Perceptions. In our everyday life we perceive or form impressions of people, objects, and situations. Often our perceptions are the result of sensory stimuli; that is, we react to things we see, hear, touch, smell, or taste. We are all familiar with the simple sensory stimulus-response example of putting our hand on a hot stove. We can also "sense" in an intuitive way a situation, as when returning home to find the wife on edge after a particularly trying day. In Air Force organizational life we may perceive or sense an air of friendliness in a meeting, or we may at times feel hostility. We have all experienced those situations in which "the atmosphere was charged with electricity," or where "you could see the sparks fly." Sometimes the general atmosphere is overtly apparent to everyone, while at other times one's sensory devices will pick up subtleties not readily detectable by others.

Significant interaction among people appears to be the very heart of negotiations. In negotiations and the relationships which constitute them, perception plays an important if sometimes intangible role. During negotiations, the people involved perceive each other and interpret the behavior they "see." Perceiving is not necessarily a slow, careful process of observation, synthesis, and conclusion. Often the perceptual process is fleeting and not even done at the conscious, cognitive level. For example, the way a person is perceived in his role as a negotiator may determine how others react toward him and accept his ideas. A person's own perceptions of the people with whom he is negotiating will, in part, influence how he functions as a negotiator. In preparation for negotiations, where facts or rumors exist about other parties, the negotiator takes into account explicitly or implicitly these facts or rumors. The success of negotiations may depend, then, to some extent on how the negotiator is perceived as well as on the issues under negotiation. The ability of people to negotiate may be affected by a rather complex sensory and perceptual process of which they are only dimly aware. The perceiver's knowledge, adroitness, personality, preparation, and

perhaps other factors are related to and dependent upon a perceptual background that has developed over a lifetime. Awareness of perceptual cues and biases should in no way diminish a person's overt preparations for the negotiations into which he plans to enter; that is, he should not discount visible, tangible items in the belief that only certain other facets of his appearance and personality will be significant. Each of us should be aware that perceptions are a factor in interpersonal relationships.¹

Perceptions may not be an accurate measure of what we see, hear, and feel; they can be quite distorted. Too, perceptual distortion may be present and reflected in negotiators' not "seeing" the same sets of "facts" and "interpretations."

Turning to specific factors that have a psychological effect on us with respect to others, let us consider the *forming of impressions of people* and things that may color or interfere with our judgments. Our own values, needs, and expectations will influence the impressions we form of others.

The difficulty in the everyday world is that we can't always arrange to have our first impressions based on significant material. Thus, the only safeguard is to avoid forming impressions too early in the perceptual process.

First impressions are lasting because they influence the way in which we will "see" all subsequent data about the person. Unfortunately, they are more likely than not to be inaccurate.²

One of the first impressions we gather of people has to do with physical appearance. People have preconceived ideas of what leaders look like, but there has been a tendency to forget the many exceptions. In a speech on leadership, Lieutenant General Ira Eaker, the World War II Eighth Air Force commander, has observed:

I read an acknowledged authority one day who said that all great leaders of the past had one thing in common, great physical stamina, and all great leaders of the future must be sound of wind and limb. A great plea for physical fitness. By a strange coincidence the

same day I read a little passage I pass on to you. "Down the streets of Portsmouth, more than a hundred years ago, walked a sailor with one arm, one eye, a persistent state of nerves, and unable to tread a ship's deck without being seasick. Indeed he would probably have been in a home for incurables, were not his name Admiral Lord Nelson. The man's spirit drove the flesh." The point is when weighing the characteristics of a leader, remember a stout spirit can drive a weak body a long way.³

Our perceptual bias may influence our thinking, and we could well have a preconceived notion of what a negotiator "ought" to look like.

As a corollary to physical appearance, consider *status*. If we are prepared to negotiate with a senior officer and at the time of actual negotiations we are confronted with an individual considerably further down the organizational or rank hierarchy, our perceptions may be changed and our judgments of his behavior considerably influenced.

. . . even though two people behave in identical fashion, status differences between them cause a perceiver to assign different motivations for the behavior. In an experiment, after a high status person and a low status person were introduced to the subject, they were asked by the subject to comply with a request. At the same point in the experiment, both did. The subject, nevertheless, did not perceive both as equally cooperative. He judged the high status person as *wanting* to cooperate; the low status person as *having* to cooperate and, in turn, he expressed more liking for the high status than for the low status person.⁴

Tied in with status is the construct of *role*. The remarks of a negotiator who represents a particular orientation, say operations, may be perceived differently from the same remarks made by a negotiator who is in research and development. Also, if we know the role of the negotiator in his organization, chances are we will perceive him and his behavior differently than if we do not know his organizational role. For a doctoral dissertation dealing with the role of the Assistant to the President in business settings, people

in an organization were asked, "What is the role of your Vice President for Sales?" The question usually evoked a straight answer. But responses regarding the Assistant-to, with his nontask-directed title, suggest often that he fills a nebulous role and has, because of his proximity to the social atom of the President, unknown amounts of power and influence. Reactions of others to the role of the incumbent of the Assistant to the President position indicate altogether different perceptions not necessarily related to that official title.⁵

Categorizing on the basis of roles is similar to the idea of *stereotyping*. Stereotyping is sometimes referred to as pictures in people's heads which guide rightly or wrongly their perceptions of others. Stereotyping sometimes influences our perceptions of particular groups, e.g., poor people, rich people, scientists, doctors, fighter pilots, etc. Stereotyping can certainly occur in negotiations, especially where negotiations are on a sustained basis between unchanging parties. A study by Mason Haire on role perception in labor-management relations is an example of stereotyping.⁶ Haire used two pictures and four descriptions. Though the pictures were different, they represented middle-aged, moderately well-dressed men with no particular facial expressions. Descriptions contained the same general characteristics, but items were arranged so that the descriptions did not sound like the same man. In half the cases, the man in the picture was identified as "local manager of a small plant which is a branch of a large manufacturing concern," and in the other half as "Secretary-Treasurer of his Union." The subjects of the study were 76 members of a Central Labor Council and 108 representatives of management, all from the same geographical area. The subjects were told that this experiment was part of a research project to ascertain how well people could analyze personality when given but a few facts. After studying a picture for a brief period, the subjects were asked to check from a list of over 200 adjectives those which they thought applied to the man in the picture. With the data accumulated, the researchers hoped to gain tentative answers to the questions, "How does

management see labor and management, and how does labor see labor and management?" Without going into any of the specific statistical data, the most apparent conclusion is as follows:

. . . when a member of either group (management or labor) describes a person, the description varies markedly depending on the role of the person described, although the facts and the pictures are identical.⁷

Halo effect is another factor that could affect negotiations. The halo can serve as a screen, keeping the perceiver from actually judging several traits; instead, he overreacts to only one trait. For example, a commander may single out one aspect of an officer's record—either good or bad—and use this as a basis for his officer effectiveness report (OER) ratings. Specifically, appearance could override other considerations that might have more relevance to the job at hand. An Army study showed that officers who were well liked by their men were perceived to be more intelligent than officers who were not as well liked. Yet both groups of officers had virtually the same scores on intelligence tests.⁸ Halo effect is not just peculiar to individuals judging other individuals; groups may judge a situation and, because of known facts or perceived relationships, apply a halo.

Projection is a defense mechanism wherein our current emotional state tends to influence our perceptions of others. If we have been severely reprimanded by the boss, we may tend to look upon others who remind us of the boss as being aggressive and of potential harm to us. Another form of projection is to attribute to others some of our own undesirable characteristics or traits. For example, if we are aggressive, we may see this trait in others more readily than would another perceiver who is low on the aggression scale.

Another factor concerns the *characteristics of the perceiver*. Current findings appear to indicate that an individual uses himself as a norm against which to judge others.⁹ Five conclusions regarding this area are as follows:

1. Knowing yourself makes it easier to see others accurately.

2. Our own characteristics affect the characteristics we are more likely to see in others.

3. The person who accepts himself is more likely to be able to see favorable aspects of other people.

4. A corollary is the finding that, for people we like, we tend to perceive more accurately the ways in which they are similar to us and less accurately their unlike ways.

5. Accuracy in perceiving others is not a single skill that some people have and others do not.

Relating these findings to our previous analysis of perception, we should ask ourselves the question when judging another, "Am I looking at him and forming my impressions of his behavior, or am I just comparing him to myself?" Obviously, such an incisive, searching question could easily shed light on our approach to negotiations. It is possible to maximize the microcosm of negotiators' personality differences almost to the exclusion of the larger issues at hand! Caution: I am not saying to neglect the personal aspects of the negotiation; I am only saying to recognize them and deal with them but not to be obsessed by them.

As negotiators, we try to be objective and get the necessary data. However, in so doing we may be deceived into believing that *facts and values* are necessarily separated.

It would be very useful and convenient if the premises of administrative [or negotiation] choices could always be divided sharply into factual and value premises. Unfortunately, a clear separation of these two types of premises is not usually possible. Almost every value premise has some factual element imbedded in it—an element that cannot be completely removed—because most ends or goals are at least partly means to more final ends rather than ends in themselves.¹⁰

So far, I have neglected to mention certain well-known *biases* which we encounter, at least through reading, almost every day: cultural, ethnic, religious, and racial biases. We should recognize that these biases can influence us and our interactions with others. Often we tell ourselves that our degree of maturity and sophistication obviates these

biases' entering into the picture. But bias can be insidious, almost subconscious, and already programmed into our emotional if not cognitive processes.

Before going on to consideration of groups, we might conclude this section by restressing the *complexity of man*. Maslow has given us his famous hierarchy in which man's wants and needs are depicted in an ascending structure.¹¹ From the bottom to the top, man is concerned with physiological, safety, and social needs. Following these come needs for ego-satisfaction and self-esteem, for autonomy and independence, and, finally, for self-actualization in the sense of maximum use of all his resources. We cannot leave our feelings, needs, motives, and perceptual errors at the door to the negotiations room. Man is wanting and complex; and much as we would like to be objective in the negotiation process, it would be difficult to do so without totally removing the human actors.

Man is not only complex, but also highly variable; he has many motives which are arranged in some sort of hierarchy of importance to him, but this hierarchy is subject to change from time to time and situation to situation; furthermore, motives interact and combine into complex motive patterns. . . .¹²

groups

Since negotiations take place between groups about as often as they do between individuals, we should consider some characteristics of groups. Certainly some of the interpersonal aspects that apply to individuals will apply also to groups. Groups, though, exert certain unique forces on their members.

It has been noted that intergroup conflicts . . . probably dissipate more energy and money than any other single organizational disease. Intergroup conflict, with its "win-lose" orientation, its dysfunctional loyalty (to the group or product, not to the truth), its cognitive distortions of the outsider (the "enemy"), and its inability to reach what has been called "creative synthesis," effectively disrupts the commitment to truth.¹³

I think everyone will agree that this statement

all too often applies to negotiations. Perhaps we had better take the win-lose concept out of negotiations so that specific items are not viewed in this context!

It has been said that a group reflects synergism; that is, a group is more than the sum of its parts, something more than the individuals in it.

Norms of a group usually refer to rules of behavior that have been accepted by members of the group and that specify what the members should do. A group exerts pressure on its members to conform to its norms, and the pressure gives rise to some uniformity of behavior and the gaining of group goals. A member of the group who deviates from the norms may do one of four things: conform, change the norms, remain a deviant, or leave the group.¹⁴ Regarding negotiations and the pressure to conform within a group, the following statement appears significant:

There will be great pressure to conform . . . when a highly cohesive group is working toward an important goal or resolving an important issue and faces a large discrepant minority.¹⁵

Cohesiveness is defined, generally, as the attraction a group has for its members. It appears, then, that there must be cohesiveness even before there can be norms, for without a binding force rules of behavior and conformity would be unenforceable. By the same token, a highly cohesive group may not necessarily be a high-performing group unless the norms sanction it. Highly cohesive groups express hostility toward external threats; therefore, if one is negotiating an issue with such a group, he may expect to find solidarity and his presence acting as a coalescing factor.

Group vs. individual problem solving. With respect to negotiations, it might be worth investigating whether a group would function better than an individual: Should we send out a team or one person to do our negotiating? Any attempted specific answer applicable to all situations would be spurious. However, we can be aware of some such general statements as the following:

1. Group performance is frequently better

than that of the average individual; it is seldom better than the best individual. In fact, the group's superior performance may well result from the efforts of one superior problem solver.

2. The measure of a group's efficiency should be the total number of man-hours spent in solving the problem, not just the lapsed time spent by a group compared with [that spent by] an individual.

3. Group problem solving may be preferred to individual problem solving even though its superior efficiency cannot be demonstrated, when acceptance of the solution is important or when morale is a relevant consideration.¹⁶

Furthermore, it appears that the social aspect of group problem solving brings about the possibility of either a competitive or a cooperative internal relationship. As might be suspected, the cooperative group is superior on many counts, especially in the areas of coordination, interaction, and division of labor among members.

From a social viewpoint, any number of interactions take place within a group. Yet this social factor of having people work together should not be expected to produce any magical effects.

Cognitive aspects of individual versus group problem solving should also be considered. "Perhaps the most significant advantage of groups over individuals is found in the type of problem that requires an extensive background of varied information for its solution."¹⁷ Of course, these varied backgrounds may also be accompanied by varying values, emphasis, and points of view which could create dissension and make the price of the inputs quite high. In the case of ambiguity, the pool of opinion in a group may lead to a more accurate conclusion than an individual could make working alone.¹⁸ Where negotiations may involve multifaceted, complex, even unclear issues, it might be well to consider the use of a cooperative group with varied backgrounds. Also, there tends to be something of a better psychological acceptance of decisions reached by a group than those reached by an individual.

Innovative but risky ventures, more adventurous policy decisions, somewhat risky capital investment, even methods changes of some

types are more likely to be recommended after group decision than by individual's forwarding their recommendations on an individual basis.¹⁹

We can say that, in general, groups are effective

- whose practices and procedures enable them to carry out systematically the steps in problem solving and whose members have skills appropriate to the nature of the problems faced;

- that have received training in problem-solving strategies and whose efforts are appropriately motivated;

- that have a stable status system, familiar to all its members;

- whose size is large enough to accomplish the task but not so large as to introduce distracting organizational problems;

- that are cohesive, interacting cooperatively with members possessing compatible personality characteristics; and

- that are operating under mild to moderate but not extreme stress.²⁰

communication

Communication is a sharing of information between at least two people and may be accomplished verbally, by written transmission, or even symbolically. Attitudes and behavior are forms of communication. Negotiations cannot take place without some form of communication, nor should negotiations be limited to interchange among participants; they should include results and aftermath as well.

Communication systems are filled with "noise." While noise may, quite literally, involve physical disturbance, of more importance appear to be factors such as perceptual distortion, biases, anxiety, stress, status differentials—all of which contribute to the noise syndrome. For example, we would hope that "true" communication in an organization would take place between a boss and his subordinate. But suppose the boss is an autocrat and is merely looking for support—a "yes" man—from his subordinate. If the subordinate perceives his own security, promotion potential, and the like as a function of pleasing the

boss, one may be sure that he will carefully filter or screen his communications to the boss. Likewise, a session where subordinates have an opportunity to talk to the boss may not involve communication at all. If the boss, through overt behavior and attitudes, indicates a threat to the subordinates, there may be an exchange of conversation but no real communication. Another form of noise is more subtle but can be just as debilitating. Communications carry with them value judgments. Even where "open" communication exists, a person generally cranks in his own feelings, and this can distort the communication. In deferring to the judgment of a person whom we regard as superior (in status, rank, knowledge, position, etc.), we may be merely adding to the noise. Negotiators may engage in double-talk, intentionally or not, masking the real issues. All of this tends to negate real understanding or at least make it more difficult.

What did he say? This question indicates more than just physical distortion in hearing or reading. Carl Rogers is concerned with the concept of understanding others.²¹ If we allow ourselves to be too strongly influenced by preconceived prejudices, we do not listen with understanding. We should, therefore, be concerned with not only what is being said but also why it is being said. Consider some of Rogers' statements about understanding:

In my relationships with persons I have found that it does not help, in the long run, to act as though I were something that I am not.

I find that I am more effective when I can listen acceptantly to myself, and can be myself.

I have found it of enormous value when I can permit myself to understand another person.

I have found it enriching to open channels whereby others can communicate their feelings, their private perceptual worlds, to me.

I have found it highly rewarding when I can accept another person.

The more I am open to the realities in me and in the other person, the less I find myself wishing to rush in and "fix things."

It has been my experience that persons have a basically positive direction.

Life, at its best, is a flowing, changing process in which nothing is fixed.

These statements have relevance for the negotiator in that he must recognize that he is the possessor of a complex value system. Therefore, he should be "open" to conflicting motives and complexity in others.

Communication networks focus on communications as a linking process. In negotiations, the parties must interact, and the "communication network" provides interconnecting channels through which messages travel. But it must be recognized that this network is a very complex mechanism, containing intermeshed loops which do not necessarily behave in a continuous, direct pattern. The network receives inputs, processes these inputs, and produces feedback or outputs. For the purposes of negotiations, we should attempt to maximize speed and accuracy in the network and ensure some degree of satisfaction for the network participants. There is no "one best way" to establish communication nets. Much depends on how many are involved in the negotiations, how complex the issues are, how much "noise" exists (e.g., If we are negotiating with foreigners, what are the role and influence of the interpreter?), the composition and attitudes of the group, etc. A paradox does become apparent with nets. Those nets which maximize speed and make for greater efficiency in the transmission of information and decision-making may minimize the degree of personal satisfaction of persons in the group. For example, where one man speaks for the group, he may be able to receive, assimilate, and react to the issues without consulting his colleagues. This is certainly quick, but how about the feelings of the rest of the negotiating team?

IN THIS concluding section, it seems appropriate to quote a few passages from Mary Parker Follett on the constructive resolution of conflict in business settings:

. . . I should like to ask you to agree for the moment, to think of conflict as neither good nor bad; to consider it without ethical prejudice; to think of it not as warfare, but as the appearance of difference, difference of opinions, of interests. For that is what conflict means—difference.

There are three main ways of dealing with conflict: domination, compromise and integration. Domination, obviously, is a victory of one side over the other. This is the easiest way of dealing with conflict, the easiest for the moment but not usually successful in the long run.

The second way of dealing with conflict, that of compromise, we understand well, for it is the way we settle most of our controversies; each side gives up a little in order to have peace, or, to speak more accurately, in order that the activity which has been interrupted by the conflict may go on. It is the accepted, the approved way of ending controversy. Yet no one really wants to compromise, because that means a giving up of something. Is there then any other method of ending conflict? There is a way beginning now to be recognized at least, and even occasionally followed: when two desires are *integrated*, that means that a solution has been found in which both desires have found a place, that neither side has had to sacrifice anything.²²

At the beginning of this article the idea of resolving a real or potential conflict to the mutual satisfaction of all concerned figured in the definition of negotiations. It is my firm belief that a positive approach to negotiations and the seeking of a mutually agreeable solution may well be best achieved by Mary Parker Follett's idea of integration.

In order to do this, one important facet must be the recognition of the existence of individual differences among people. If we are ready to reject the feeling that others are, or should be, exactly like us and reject the notion that man is a rational-economic model whose biases, feelings, background, and affective influences have been left outside the negotiation room, then we will have taken a quantum step forward. We have feelings and others have feelings. We behave and others react, and vice versa. If we at least recognize and are positively prepared for these differences, negotiations may have a better chance of being integrative, rather than compromised or based upon domination.

Obviously, the analysis did not take into consideration the issues at stake in any particular set of negotiations, nor were relative

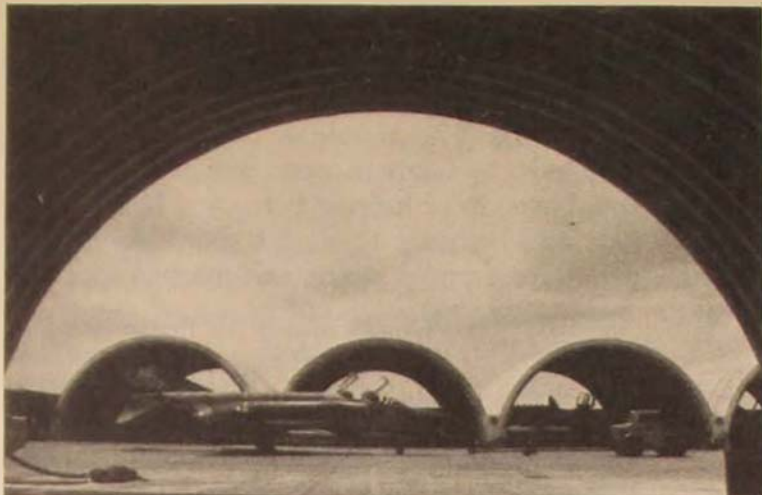
power positions discussed. Both issues and power are interdependent with interpersonal factors. However, issues and power positions may be known before negotiations take place; interpersonal differences may not be revealed until the negotiation process is under way.

As long as people interact together, we will have to concern ourselves with interpersonal aspects of human behavior. If we recognize and consider them, we should be able to negotiate from a more enlightened position.

United States Air Force Academy

Notes

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CIVIL ENGINEERING DIRECT MISSION SUPPORT FORCES

Major Thomas S. Collins

IN Southeast Asia, USAF Civil Engineers have proven their ability to provide, operate, and maintain the facility platform from which the Air Force flies and fights. Base Civil Engineering personnel, Prime BEEF teams, and RED HORSE squadrons have provided the Air Force with responsive organic military engineering capability. Their performance reflects planning which anticipated the requirement for this capability.

In December 1963 a combined Civil Engineering/Manpower Study Group was established. The Study Group sought to determine the distribution, alignment, reliability, credibility, and skills required in the Civil Engineering manpower resource to perform essential Civil Engineer functions in support of the Air Force mission. Three working postulates were adopted:

1. A minimum force of military Civil Engineers must be maintained at each air base, missile squadron or wing, depot or station worldwide to maintain essential operation and maintenance services during and immediately following enemy attack, major fire, flood, or other emergency conditions.

2. A force of military Civil Engineers must be attached to each flying unit that is designated for performance of emergency missions from an unoccupied or bare (dispersed operating) base.

3. A force of military Civil Engineers must be trained in pioneer environments and be prepared to participate in unforeseen contingencies and special air warfare operations.

Results of the study showed that the Civil Engineering force of approximately 100,000 people—2000 officers, 41,000 airmen, and 57,000 civilians—was not aligned to provide a rapid mobile response capability for tactical air operations or contingencies. In addition, many Air Force installations





Prime BEEF crew repairs damage from Hurricane Camille at Keesler AFB, Mississippi.



HORSE heavy equipment, in tests at Eglin Florida, proves ability to repair bomb damage.

lacked sufficient Civil Engineering airmen to ensure continuity of essential operations during emergency conditions.

To correct this situation, the Air Force program designated Prime BEEF (*Base Engineer Emergency Forces*) was initiated in October 1964. The program envisioned has three phases, to be conducted simultaneously.

Phase I or Quantitative Phase was to determine the alignment and distribution of the Civil Engineering manpower resources needed to perform the direct combat support mission. This was a long-term effort to identify the minimum number of military required and to align the civilian/military mix accordingly. No new authorizations were to be added. Civilian positions identified for conversion to military were to be converted only upon attrition of the incumbent civilian. The key aim was to develop a direct mission support capability within existing resources. The final Prime BEEF program will reduce the total number of military spaces and increase civilian spaces, but the military skills will be compatible with direct mission support requirements.

Phase II or Qualitative Phase was undertaken to upgrade the quality of the force. It was necessary to develop entirely new airman career progression patterns. Career ladders that ended at the five or seven level were restructured. New career ladders were added in order to develop additional military capability in engineering and craft skills. Areas concerned were surveying, drafting, electrical power production and distribution, heating, air conditioning, pavements, construction equipment, carpentry, masonry, plumbing, sanitation, and fire protection. These changes were designed to provide NCOs with improved opportunity to progress to key supervisory positions in the base Civil Engineering organizations. New and revised technical training programs were required to develop a military force that possessed the necessary engineering skills and supervisory knowledge to perform successfully in these new positions.

Phase III was to establish within the Air Staff a field activity to manage the development of the military Civil Engineering force.

The single most important area in Prime BEEF was defining the requirement for military Civil Engineers over the entire spectrum of probable contingency response. For Civil Engineers this ranged from site survey, selection, and buildup of new bases to the augmenting of Civil Engineer forces at established Air Force bases. The requirement must be defined in quantitative as well as qualitative terms. That is, how many people are needed, and what skills should they possess?

The task was simplified to some extent because it was not necessary to add new authorizations to the work force which operates and maintains Air Force facilities. Rather, it was possible to realign the military/civilian mix in this work force. Thus it is possible to have an in-being mobile military engineer capability as part of the normal day-to-day base maintenance force.

Training

Prime BEEF electrical power linemen at Sheppard Technical Training Center, Texas, demonstrate use of auxiliary crossarm for hoisting high-voltage primary conductors. . . . Students in the entomology course at Sheppard learn the techniques of mosquito larviciding. . . . Carpenters and masons take the 12-week builder's course at the Navy's Port Hueneme, California.





Over the years, consideration of the military/civilian mix at only one base or one command made it difficult to justify a military position rather than a civilian position. Consideration of the total Air Force mix of skills and grades made it possible to get a much better balance of military skills and grades, with the result that even though Prime BEEF reduces the overall military authorizations and increases civilian authorizations, there is much greater confidence that the Air Force has a military force with the required skills. Standardizing grades and skills makes it possible to tailor a Prime BEEF deployment to the requirement. For example, entire teams can be deployed or teams consisting of skill blocks from several teams, such as electricians, can be formed.

These concepts in Prime BEEF require centralized management of the Civil Engineering force in some areas. The USAF Civil Engineering Center was established at Wright-Patterson AFB, Ohio, with management and monitoring of the Prime BEEF program as one of its principal functions. In addition, the center has Air Staff responsibility for planning, coordinating, and integrating all actions involving the activation, manning, training, equipping, and deploying of squadrons known as RED HORSE (*Rapid Engineer Deployable—Heavy Operations Repair Squadron, Engineer*). The center's responsibility for sustaining and improving Civil Engineering mobile capability also includes mobility planning, facilities, materials, and equipment and pavements.

Several types of mobile teams were established, each manned, trained, and equipped to deploy with as little as four hours' notice. Upon arrival at their operating location, they are able to sustain themselves completely for a period of 72 hours. Assigned personnel are part of the normal base work force when not deployed.

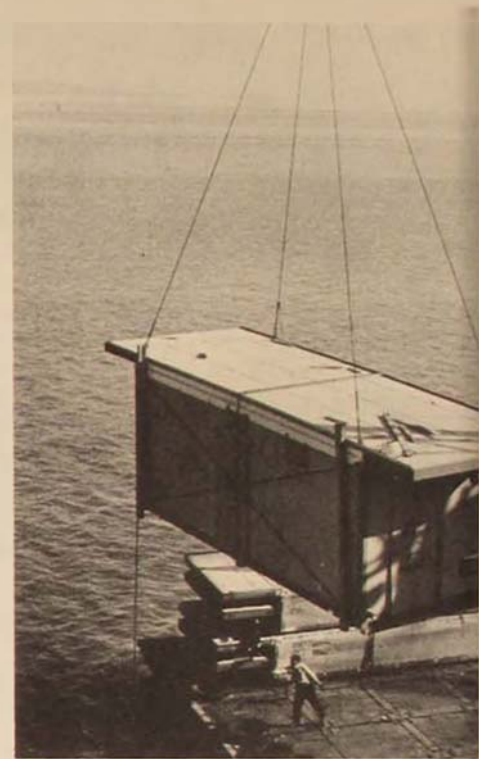
The *contingency* or "C" team is a 60-man team designed to support contingencies and special air warfare operations. Forty-seven of these teams are located at installations throughout the Air Force. Their equipment is limited and consists of individual equipment and tool boxes. There are also team kits which provide items such as generators, power tools, and welding equipment. The equipment is air-transportable.

The *flyaway* or "F" team also consists of 60 men. There are 24 "F" teams, each assigned to a specific unit of the Tactical Air Command or Military Airlift Command. These teams are primarily concerned with the immediate beddown of tactical units, using prepositioned Harvest Eagle kits for immediate facilities.

The *engineering* or "E" team consists of 40 men. There will be a total of 15 of these teams. They perform the functions of site selection, engineering design, and construction surveillance.

Logistic support or "LS" teams of 144 men are located on Air Force Logistics Command bases, and *missile* teams of various sizes are located in the Strategic Air Command.

Each Air Force base also has a *recovery* team, consisting of the minimum number of military personnel required to



In Korea

Pre-engineered, relocatable Modulux buildings arrive by ship at Inchon. . . . A tent city, put up by Prime BEEF "C" and "F" teams, provides instant shelter for personnel deployed in Operation Combat Fox. . . . A RED HORSE squadron erects the first Modulux at Osan. . . . A tent still takes know-how and muscle power. . . . Concrete finishers work on foundations for Modulux dormitory.



Prime BEEF "C" and "F" Team Composition

<i>Title</i>	<i>Quantity</i>
Civil Engineer Officer	1
Metal processing	2
Electricians	5
Electrical power production	4
Refrigeration /air conditioning	2
Heating systems	3
Pavements	3
Construction equipment	5
Structural	7
Plumbing	5
Site development	2
Sanitation	6
Fire protection	10
Miscellaneous	5
	60
Total	

maintain essential services during attack or emergency. *Composite* teams can be formed, consisting of skill blocks tailored to a given job, such as plumbing, electrical, or sanitation. This increases the flexibility of Prime BEEF.

Just ten months after the program was initiated, Hq Pacific Air Forces (PACAF) requested a Prime BEEF team to erect protective aircraft revetments in Vietnam. Requests for other teams followed. A total of 49 composite teams totaling over 1800 men were deployed to Southeast Asia (SEA) to accomplish a wide variety of projects.

The Civil Engineering response to the *Pueblo* incident as part of Combat Fox was the first deployment that tested the mobile response concept fully. The entire "C" and "F" teams (not composite teams) were deployed from several bases. Teams were alerted and deployed from their bases in the United States within the prescribed response limits. In Korea, Prime BEEF teams played a key part in providing the facilities essential to the operational mission of other deployed units. They erected tents and frame buildings, dug wells, laid airfield matting, installed aircraft arresting barriers and sandbag bunkers, and rehabilitated buildings and utility systems.

Prime BEEF teams have also deployed to Alaska, Antarctica, Keesler AFB, Mississippi, and within commands to provide disaster recovery and satisfy requirements for skilled personnel.

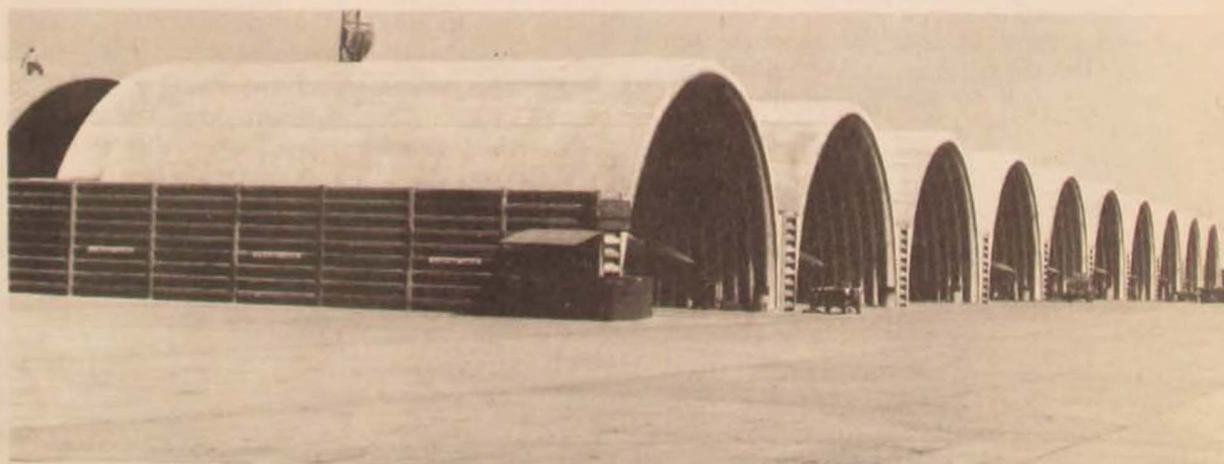
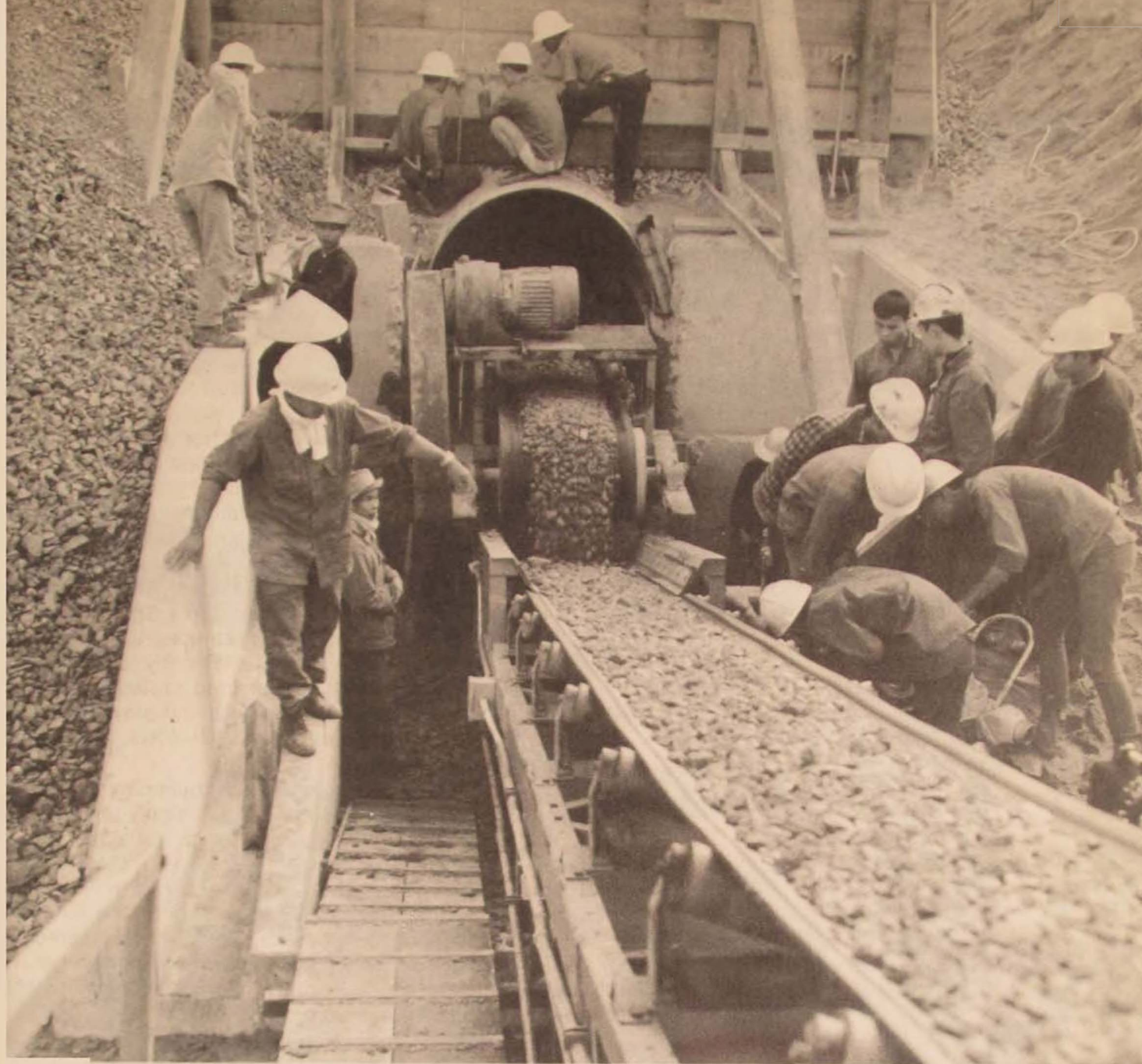
Although the Prime BEEF teams provided mobile rapid-response forces, they were not manned or equipped to repair or upgrade airfields and facilities required by the tactical forces. In Southeast Asia the demand for heavy repair forces in 1965 and 1966 far exceeded the capabilities in-theater. RED HORSE was conceived to provide the Air Force with an organic capability for heavy repair and to erect theater-of-operations facilities. Heavy repair includes repairing bomb or other enemy-inflicted damage and major



In Southeast Asia

The squeeze-crete machine pours concrete onto the corrugated steel protective shelters. . . . Rock and sand move by belt into the cement mixer. . . . Modulux buildings go up at Cam Ranh Bay Air Base. . . . RED HORSE teams built the concrete and steel aircraft protective shelters and revetments at Da Nang.







Somewhere in Korea, a site selection team orients a map to the local terrain, using a plane table . . . prepares to drill 50 feet for subsurface exploration.

restoration of badly deteriorated facilities. Erecting theater-of-operations facilities includes transportable, pre-engineered or modular buildings, aircraft revetments, and shelters.

RED HORSE is manned and equipped to accomplish much larger projects than Prime BEEF teams. A squadron has 400 military personnel assigned. It has its own food service, medical, and supply personnel. A squadron has 290 items of major construction and vehicular equipment. Air Force policy requires that RED HORSE squadrons be assigned no lower than to numbered air force, so as to ensure their full utilization on the highest-priority projects and to maintain their mobility.

To alleviate the critical demand for Air Force facility support in Southeast Asia, two RED HORSE squadrons were activated and deployed in four months' time. Later, in the spring and summer of 1966, four additional squadrons were formed and deployed to SEA. Without RED HORSE in Southeast Asia, many of the facilities necessary for conducting air operations would not have been available.

RED HORSE was required again in Korea. Shortly after the initial deployment of Prime BEEF, a RED HORSE squadron was formed and deployed to augment and finally to replace the Prime BEEF teams. RED HORSE erected protective aircraft shelters and pre-engineered buildings and provided operational and support facilities for crew quarters, ammo storage, and aircraft maintenance.

Mobility is rapidly becoming the trademark of the Air Force. In many areas of the world, it is highly unlikely that tactical forces will be able to deploy to airfields that are capable of sustaining combat operations without facility upgrading. Experience in Southeast Asia and in Korea has demonstrated that Prime BEEF and RED HORSE, the Air Force organic engineering forces, are required to ensure a credible Air Force response to contingencies. In-being military Civil Engineers, trained and ready with necessary equipment, must be available for rapid deployment.

The outstanding performance of Civil Engineers in Southeast Asia, Korea, and elsewhere substantiates the efforts made to upgrade the quality of Civil Engineering personnel. The technical training courses established in pavements, carpentry, masonry, construction equipment operation, site development, plumbing, electrical distribution, and numerous other areas provided a foundation; day-to-day challenging work provides the experience; and individual desire and confidence provide the motivation. There is no longer any doubt that Civil Engineering Prime BEEF personnel possess the training, experience, and motivation to ensure a credible response in support of worldwide short-term contingencies. For longer operations, Civil Engineering RED HORSE squadrons are available to erect and maintain necessary sustaining facilities. Air Force Civil Engineers are ready and capable of responding to all types of worldwide emergencies and contingencies.

Hq United States Air Force

Air Force Review

COMPUTERIZED CONTROL: BOON TO ARIA

MAJOR GENERAL DAVID M. JONES



WITH electronic computer systems established firmly in practically every human process from manufacturing to medicine, it followed naturally that computer technology would be applied to the complex field of operational control for test instrumentation aircraft. Such an application has become a fact at the Air Force Eastern Test Range near Cape Kennedy, where computer techniques of a wide variety have made possible our great progress in national missile and space programs.

Computerized operational control for Apollo Range Instrumentation Aircraft (ARIA) is in-being at Patrick Air Force Base, Florida, home of the eight-plane fleet of ARIA EC-135Ns and headquarters of the Eastern Test Range. Immediate dividends have thus been realized in better control and utilization of the ARIA fleet, improved support for missile and space missions, and more efficient programming of maintenance and training. The feasibility of applying similar computer techniques in other aircraft operational environments becomes more apparent each day.

The ARIA is a complex aircraft with a complex mission. Its precise and positive positioning and control are essential to the manned space missions of the National Aeronautics and Space Administration (NASA) and to missile programs of the Department of Defense. A smoothly functioning Aircraft Operations Control Center (AOCC) was set up at Patrick at the outset of the ARIA program. Now the computer has been added to provide the Information System that makes up the AOCC/IS.

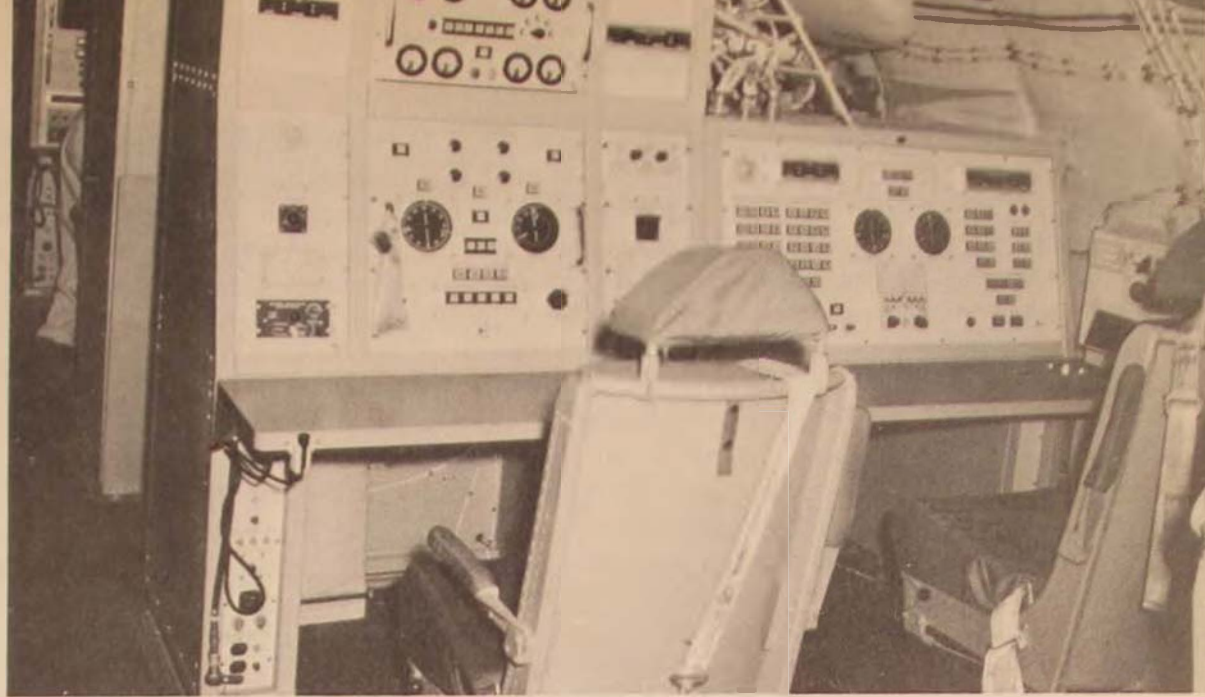
As aircraft become more complex and versatile to satisfy complicated mission requirements, so has control of such aircraft become more demanding. Effectiveness of control is dependent on the quality of information that flows between the command post and the aircraft crew. Efficiency in the management of air operations requires a constant feedback of information, such as aircraft position, fuel remaining, mechanical status, and preliminary estimates of accomplishments. These data must be updated constantly, as they will have effects on other decisions. This is most important when contingencies occur.

The aircraft controller finds himself looking for solutions to problems that arise when events do not occur as planned. An example is an aircraft having maintenance difficulties before takeoff. One of the questions facing the controller is: What is the latest time that this aircraft can take off and still accomplish the mission as planned? Another: If this mission is not accomplished, how is this going to affect the overall plan? Another: Considering the importance of the mission and aircraft generation time, what other aircraft should be programmed to accomplish this mission?

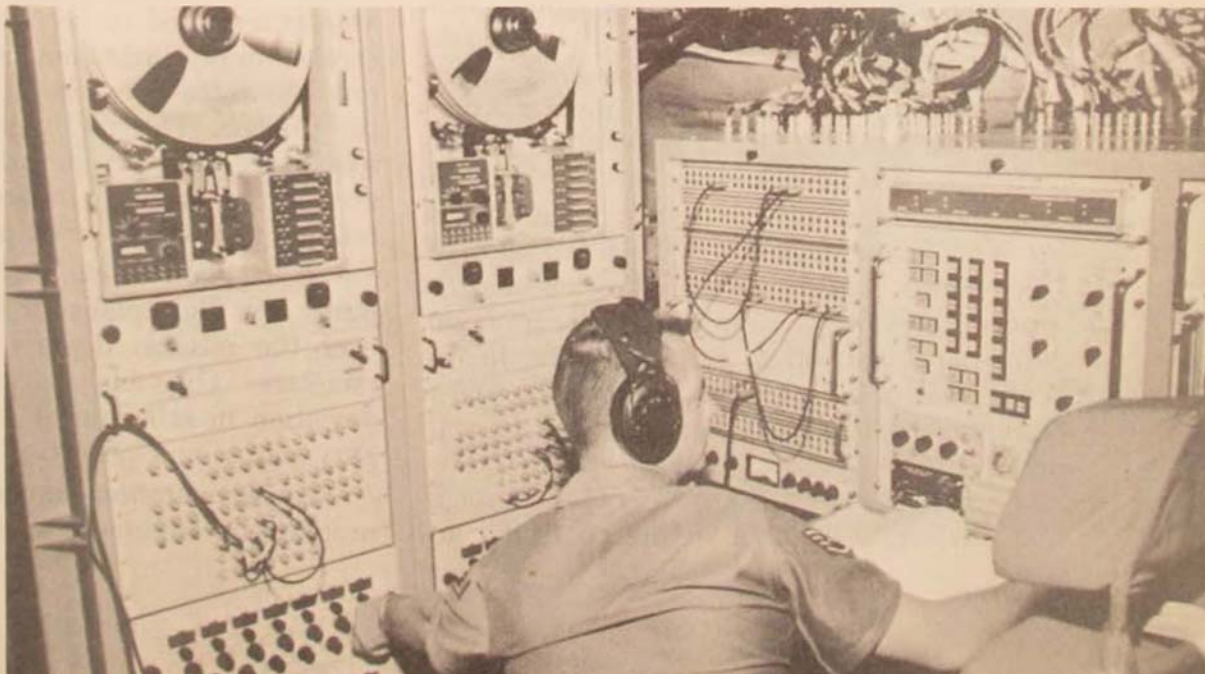
These and thousands of similar questions are answered each day by aircraft controllers working in both wartime situations and normal peacetime operations. In some instances the possible courses of action may be staggering. The selection depends greatly on the ability, intelligence, and experience of the controller. Here is where a computer that examines all possible solutions and recommends courses of action is welcome.

A computer that examines all possible solutions and eliminates those that do not meet a preset criterion helps the controller make a sounder decision. The real-time computer allows the controller to test his solution by extrapolating ahead and examining what the situation will be one, two, or more hours from the present for a given solution. In this way the controller can validate his decision before it is actually selected—a process that could be difficult and lengthy without the aid of a computer.

ARIA, as part of a worldwide communications network, provides two-way voice relay between the Apollo spacecraft and the Mission Control Center at Houston, Texas. The ARIA fleet is made up of eight modified Boeing C-135 transports. It supplements instrumented ships and land-based stations in obtaining critical data from spacecraft while in parking orbit, translunar injection, and re-entry. Using its 7½-foot steerable antenna, ARIA also receives telemetry signals via VHF and S-band systems. This vital information, containing data ranging from position of switches to heartbeat rates, is recorded and retransmitted to ground stations within VHF and UHF range.



The eight Apollo Range Instrumentation Aircraft (ARIA) of the Eastern Test Range, in conjunction with the Aircraft Operations Control Center at Patrick AFB, are essential to the missile and space missions of NASA and DOD With the world's largest steerable antenna in its nose, the EC-135N ARIA becomes a vital link in a worldwide communications network, providing two-way voice and data relay between Apollo and Mission Control Center, Houston, Texas. . . . The array of instruments in the EC-135N



Understanding the complexity of control problems requires a brief examination of the Apollo mission. The position in parking orbit when the SIV-B stage of the Saturn V rocket is ignited to start the trip to the moon is a function of time. The point at which translunar injection (TLI) occurs moves continuously with time within the launch window. TLI should occur in the second revolution if the mission is normal, and in the third revolution as the last opportunity. The net effect of having a large launch window (and consequently variable launch azimuth) and two opportunities for the TLI is that the TLI point may be located somewhere in an area of around 20 million square miles in the Indian and Pacific oceans. As NASA requires telemetry collection and voice relay for certain critical periods prior to and during TLI, it is necessary that ARIA be able to react in real time to provide that support.

A somewhat similar situation occurs during re-entry. Weather, sea conditions, or other factors could cause a change in the recovery area. This was experienced during Apollo 9, when sea conditions made it desirable to move the impact area 400 miles to the south of the original area. During re-entry, ARIA provides voice relay before and after communications blackout. It also uses HF homing to determine spacecraft location and again supply voice relay from the spacecraft to recovery forces. The name of the game is mobility.

The problem of supporting Apollo missions is complicated further by the fact that TLI could occur over a vast ocean area a great distance from any base. Fuel and wind conditions can be vital factors in whether the aircraft can reach test support positions at the proper time and then proceed to a land base.

The AOCC-Information System takes all factors into consideration and computes test support positions, acquisition information, flight plans, and other pertinent data. It also keeps track of each ARIA and the Apollo spacecraft and displays them dynamically on a wall display system.

The operator of the system is the navigation adviser, a member of the controller ad-

visory team. He uses a keyboard to send command messages to the computer. Response to the command message returns to the AOCC and is displayed on a cathode-ray tube in front of the navigation adviser. Such response may be a flight plan, a list of current test support points, a status report, an instrumentation almanac, a list of recovery bases for an ARIA experiencing a malfunction, or simply a message to the operator that there was an error in the input.

The heart of the AOCC/IS is an IBM 360/65 computer located at the Eastern Test Range's Technical Laboratory and slaved to the AOCC in the nearby ARIA headquarters. Inputs to the computer come from each of the eight ARIA, from the Mission Control Center in Houston, and from the ARIA mission controller in the AOCC at Patrick. Outputs appear on the dynamic display board in the AOCC, on a cathode-ray tube display on the navigation adviser's console, and on a teletype communications system between the aircraft and the AOCC.

Software for this operation is unique to the ARIA operation and was developed in-house at Air Force Eastern Test Range to support Apollo. The program consists of seven modules, each of which can operate independently as a complete program.

Orbit generator module: This program locates the spacecraft and determines its orbit track in relation to the surface of the earth.

TSP module: The Test Support Position module presents the exact location where the ARIA is expected to be at the proper time to receive and record telemetry information and/or make voice relay during a critical point of the mission. The TSP is computed when the spacecraft trajectory and mission requirements are figured in with the criteria for the TSP relative to the spacecraft position.

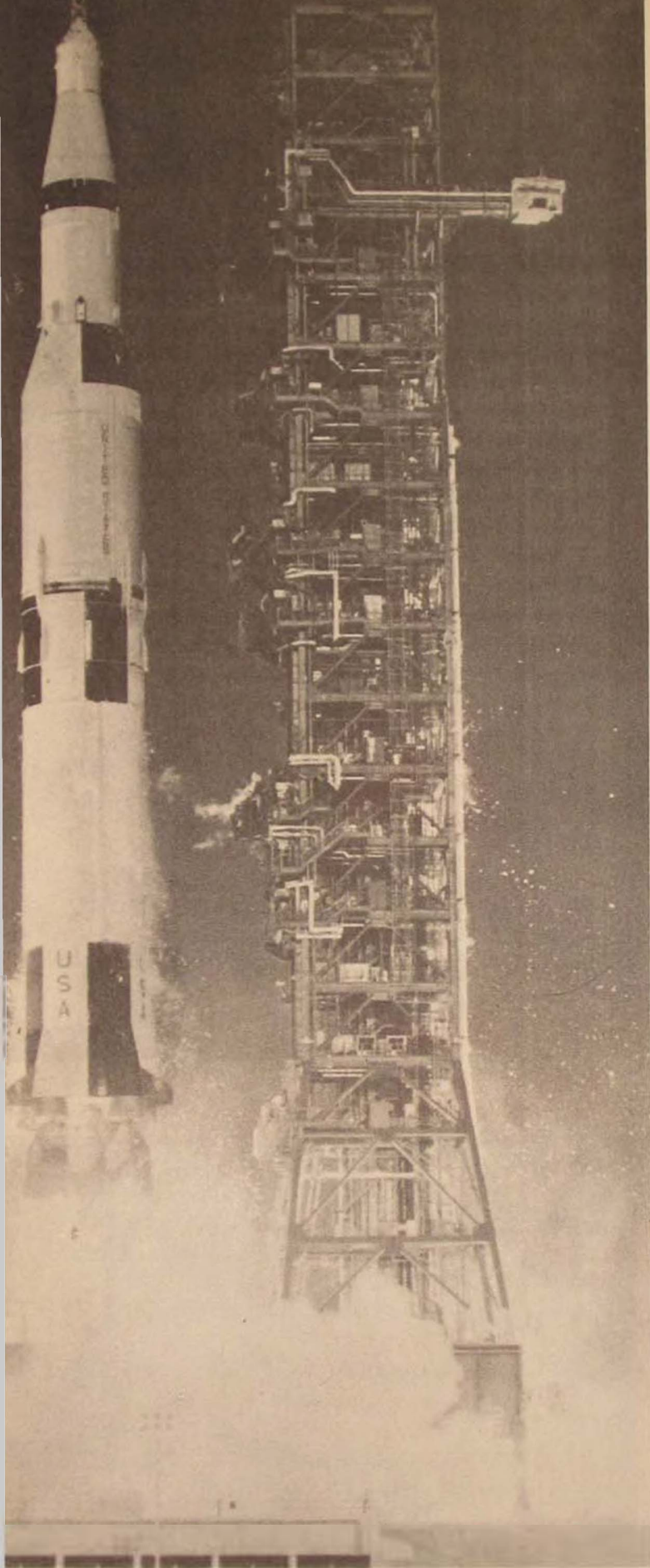
Navigation module: This program computes new flight plans for the ARIA fleet whenever the mission departs from nominal parameters. This includes trajectory change, deviation in schedule of activities, change in ARIA status, and others.

Instrumentation almanac module: This program determines the "look angles" needed



Computer technology enables ARIA controllers in the Aircraft Operations Control Center to make use of the huge flow of information in controlling aircraft effectively. . . . The data are updated constantly, including the location of each ARIA.





for spacecraft acquisition at the TSP coordinates and other important acquisition data. The large telemetry antenna in the nose of the ARIA has a rather narrow effective reception angle for maximum efficiency and consequently must be pointed precisely to get good results at maximum ranges. The acquisition information or instrumentation almanac is sent to the aircraft by teletype. Each of the ARIA has two teletype machines on board, eliminating the need for extended voice communication between the controller and ARIA.

Re-entry trajectory module: This module determines the trajectory of re-entry. It gives the splash-down point in the same manner that the orbit generator module determines the spacecraft trajectory.

Flight-following module: This program is one of the most valuable to the ARIA controller as it keeps track of each aircraft from prior to takeoff until after the last landing. The program monitors position, fuel remaining, fuel consumption rates, ETA's at significant points, status with respect to attainability of assigned TSP on time, and feasibility of the ARIA in reaching its assigned recovery base. This is a dynamic program that integrates status reports coming from ARIA in real time with all other updated information in the core.

Data display control module: This program controls a large dynamic wall display at the AOCC. It selects data from storage, modifies it if needed, and forwards it to an interface program which updates the wall display. The display is set against a background map of the area in which action is occurring. The positions of the spacecraft and the ARIA fleet are indicated.

The seven modules are connected so that the output of one module is routed directly to any of the other modules needing the information concerned. This creates a chain reaction which supplies the best available

ARIA linkup keeps in touch with Apollo, from Saturn launch at Kennedy Space Center, Florida, to the moon and

answers to the following typical questions: Where is the spacecraft trajectory? Where are the Test Support Positions? Assuming the eight ARIA are standing by at their assigned deployment base, how are the TSP's going to be assigned to ARIA? What is the latest take-off time for each ARIA? In case of abort or degradation of one or more ARIA, how will TSP's be assigned in an optimum manner? In case of nonnominal burn of the booster or any other contingency, how can ARIA provide best support? In case of aircraft emergency, what bases can ARIA reach and with how much fuel remaining over each base?

The real-time capability of the system, combined with the ease of entering command messages through a keyboard in plain language, makes the system attractive to other agencies involved in aircraft control. The system is constantly being improved to make the ARIA operation more efficient and economical and at the same time to support any changes

in requirements developed by NASA.

The AOCC/IS is at present a highly sophisticated computer system used almost exclusively in support of the Apollo space missions. In assessing its capabilities, however, one can readily see that the system could be used profitably for many other aircraft control situations. For example, the flight-following module with few modifications would be of great value to air traffic controllers.

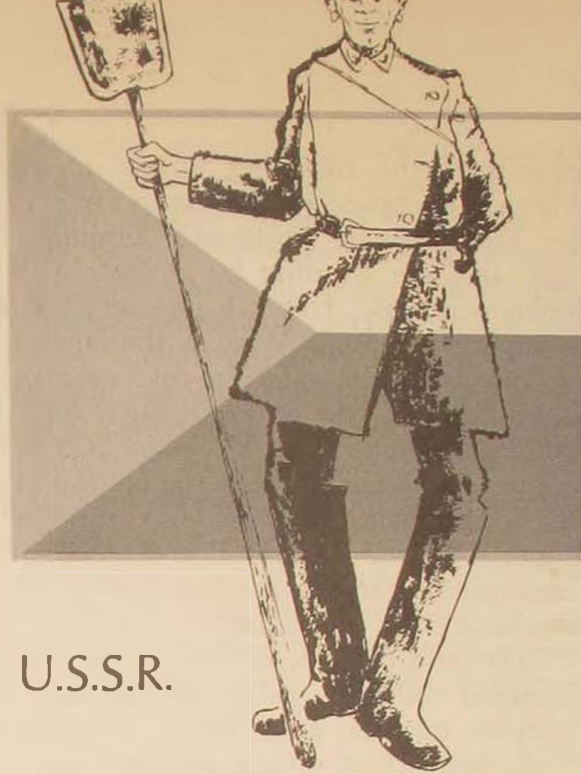
By combining the human judgment and experience of seasoned air controllers with the high-speed calculating and large-volume memory capabilities of the computer, Air Force Eastern Test Range has produced an aircraft operations control system that works. The payoff is in better and more economical employment of time, people, and equipment and in improved service and support for national missile and space programs.

Air Force Eastern Test Range

Military Affairs Abroad

GOOD SOLDIER SCHWEIK VERSUS THE U.S.S.R.

COLONEL KAROL F. RYBOS



GOOD soldier Schweik is a popular literary figure of the Czechoslovakian people. His fame and the enduring niche he holds in the hearts of his countrymen result from a highly entertaining description of his adventures in the Austrian Army during World War I. At that time the Czechs were mistrusted minorities in the vast Austro-Hungarian Empire. This mistrust, however, was not deep enough to bar their use as cannon fodder through involuntary service in the Austrian army. Czechoslovaks of every description and walk of life were impressed into service and formed into Czech regiments. This involuntary servitude was extremely unpopular with the Czechs, and dissent was expressed in many forms. In *The Good Soldier Schweik* indignation is expressed by broad humor.¹

In the book, Schweik is characterized by a willing, eager attitude toward his superiors and a bumbling, inefficient method of carrying out his duties. He sets out on simple orders with an agreeable, cooperative air—and he produces near catastrophic results. In the Austrian army he was accepted with resignation and repeatedly foisted off on unsuspecting officers as a good soldier, a willing worker. He was a little slow-witted perhaps, a trifle accident-prone seemingly, or—the most drastic evaluation—a complete idiot.

Through this process, best described as noncooperative cooperation, Schweik captured the popular imagination of the nation and became a folk hero. In fact, he became more than that; he became a national spirit. The average Czech, in moments of adversity, would adopt the protective mantle of Schweik and resort to humor to express dissatisfaction with the current realities of life. Satirical jokes, puns, rhyming plays on words, all directed at those who forced calamity upon them, would rapidly circulate from mouth to mouth. These would be embellished, embroidered, and refined; increasingly, they would become more and more critical of those in power. Historic Schweik, therefore, is not an accident waiting to happen. He is slow-witted, accident-prone, and stupid, but not unconsciously so. His well-intentioned efforts, consistently resulting in disorder, confusion, and calamity, are opportunely calculated to express nonviolent dissent. In time, this breeds open defiance.

Under the Austro-Hungarians the manipulation of Czech everyday life, the imposition of unpopular decrees, and the suppression of Czechs, in general, resulted in a slow, rising tide of dissatisfaction and a burning desire for a separate national identity, free from Austrian control. The people initially retaliated with humor to pillory Austrians and Hungarians as complete fools. The efforts of the Austrian

army to make soldiers out of contrary Czechs were ridiculed. This developed into a national pastime and soon flared into open defiance: when Czech regiments were ordered to march to the front, they might march to, through, and well beyond the front.²

Although this kind of activity was not readily available to the civilian populace, they assiduously cultivated and imaginatively applied the Schweik approach. In this they were aided and abetted by a secret revolutionary organization called "The Maffia."³ This group of individuals of like mind regarding independence from Austria consisted of members of parliament, intellectuals, authors, journalists, and lawyers. They directed the efforts of the people within the country, kept up the spirit of the populace, and disseminated information for publication abroad. Their efforts materially assisted in gaining independence from Austria and later served as the guide for resistance groups during World War II.

When German occupation became a strong possibility in 1938, the Maffia reorganized during the Munich talks, called themselves "The Political Central Committee," and commenced operations. At that time a series of political questions was raised from outside the country, and demands were made on the Czechoslovak Republic. The people were subjected to incessant propaganda and stridently threatened with the might and "right" of Germany. Hitler advised the Czech government that its treatment of German minorities was absolutely unacceptable and demanded sweeping concessions under the threat of force. After intense and hurried consultation with her allies, Czechoslovakia acceded to these demands and resolved the political questions. The view was taken that these were merely political concessions granted to a small, highly vocal minority within the borders of the country; in themselves they would not compromise national security. Soon after, however, other more unreasonable demands were made. These included annexing territory and were backed up with the threat of war. In order to preserve peace in the world, these demands also were met. Later, a defenseless Czechoslovakia was occupied, and a German

Protectorate established over Bohemia.⁴

When the Germans entered Prague, the latent spirit of resistance within the populace had been rekindled. Secret radio transmitters began broadcasting; Czech soldiers escaped to other lands, ready to fight another day; escape routes were created for political figures who were assisted to freedom to form a government in exile.⁵ Popular demonstrations were organized to express anti-German sentiment, national holidays were celebrated, and national monuments were decorated with flowers.⁶ Parades were also organized for these events, and the national colors were displayed in every conceivable fashion. Inevitably, street fights erupted between Germans and Czechs. Czechs killed in these conflicts were given massive funeral processions, in which, seemingly, the entire population joined the cortege. Invariably the gravesites would be repeatedly heaped with floral offerings.⁷

The Czech penchant for nonviolent resistance was also readily apparent throughout the cities. Street lamps were posted with signs reserving them for the occupiers. Art treasures borne away from museums by German trucks were labeled as stolen property. The people did not "understand" questions—questioners were met with blank stares and shrugging shoulders. As time went on and the German grip became tighter, the clever comedy, farce, and sharp satire evolved into more definitive acts of resistance. Railroad timetables became unreliable, supplies were misrouted, and if mail was delivered it was usually illegible due to "rain." Telephones mysteriously refused to function, and garbage was collected sporadically, if at all. Later, as German repression increased, these activities expanded to direct sabotage: factories went up in flames, explosions wrecked rail cars and bridges, material was damaged, and assassinations occurred. These efforts caused Heinrich Himmler, chief of the German gestapo, to denounce the Czech people as ten million saboteurs.⁸

SUCH all-encompassing denunciation has not been applied to the Czech nation by the Soviet leaders, but prior to the 1968

invasion their statements couched in Communist jargon strongly implied this sort of distinction to the Czech leaders. The events leading to the Russian occupation of Czechoslovakia followed a pattern somewhat similar to the German occupation following Munich. Once again, political questions were raised from outside the country. As before, these concerned internal matters, and the solution demanded was supported by the threat of overwhelming military force. In this case, the political reforms instituted by the Czech leadership of the Communist Party were considered too liberal by the Soviet hierarchy. After a series of polemic attacks by the leading Soviet party press organs, the Czech government was informed that the situation in Czechoslovakia was completely unacceptable.⁹ This was followed by a proposal to the Czech leaders to attend a meeting with the full Soviet Politburo to be held in Moscow, Kiev, or Lvov. A Czech counterproposal resulted in Russian acceptance of a meeting with the top leaders of the Czech government at the Czechoslovak border town of Cierna. At this meeting both sides agreed to a future meeting at Bratislava, also to be attended by the party leaders of Poland, Hungary, Bulgaria, and East Germany. This meeting resulted in the Bratislava Declaration, in which the Communist Party leaders of those countries pledged "firm endeavor to do everything in their power for the deepening of all-round co-operation . . . on the basis of the principles of equality, respect for sovereignty and national independence, territorial inviolability, mutual fraternal aid and solidarity."¹⁰ Yet, seventeen days after this grand pronouncement, on 20 August 1968, Russian, Polish, Hungarian, Bulgarian, and East German troops—uninvited, unwanted, and unwarranted in Czech eyes—invaded Czechoslovakia. The situation was tailored to lead to a resumption by the Czechs of active resistance against unwarranted interference in their affairs. The events leading up to the invasion and the invasion itself all bore the flavor of history; it had happened in much the same way before.

Again the stage was set for the return of Schweik, the good soldier. After being dor-

mant for more than twenty years, Schweik has suddenly reappeared in today's Czechoslovakia. His reappearance was triggered by the massive Russian intervention in Czech national affairs. Historically, any interference in Czech internal affairs provoked spontaneous Schweikian responses, and the Russians are now encountering the same spirit that baffled Austrians and confounded Germans.

A slight difference between the Munich Agreement and the Moscow announcement of the "invited invasion" is apparent. The Munich Agreement of 1938 was concluded without Czech representation. The Moscow Agreement was signed by Czechoslovak representatives abducted to Moscow under physical duress for that express purpose.¹¹ Even this abduction and the subsequent events bear a marked similarity to German methods after Munich. President Emil Hacha, then President of Czechoslovakia, had been summoned to Berlin to hear the latest demand by the head of the German state. In Berlin he was subjected to every conceivable threat, browbeaten, and rumored to be drugged before he finally signed the document that furnished the legal pretense for German occupation of Czechoslovakia. After his ordeal, observers noted his exhausted condition and obvious signs of fatigue.¹² Thirty years later Alexander Dubcek, head of the Czechoslovak Communist Party, was not *summoned* to Moscow; he was physically *dragged* there. As he was being led away, observers report that he appeared half conscious and staggered toward the waiting vehicles for the trip to Moscow.¹³ What the Czech representatives endured in Moscow before they agreed to the Russian demands is, of course, unknown; undoubtedly, it was thoroughly unpleasant. At any rate, the Russians got what they wanted, the legalistic cloak for their troops in Czechoslovakia.

When the Russian troops entered the capital, Prague, they were accorded a much more vociferous reception than the Germans received when they occupied the city in 1939. Then the people had been experiencing cyclical bursts of patriotic fervor and deep depression. War was on the horizon. Actually seeing German troops in possession of their city

streets plunged them into deep despair. They slowly rallied, however, and the Schweik treatment was applied whenever German soldiers attempted personal contact. Violent resistance did not occur.¹⁴

Prior to the Russian invasion, the citizens of Prague were experiencing soaring spirits of release, buoyed up by an exhilarating sense of national pride. The shock of seeing Warsaw Pact troops physically taking over their city quickly generated passionate resentment; soon resentment turned to anger, and bare hands were used against armored tanks. Bare hands gave way to rocks, paving stones, and Molotov cocktails; a fifteen-year-old boy burned a Russian tank with a pickaxe, some newspaper, and a cigarette lighter. Another fifteen-year-old died for refusing to give directions to the invading forces.¹⁵ In all, some 100 Czechs died expressing their defiance. Fortunately, before their deaths inflamed the populace to even greater efforts against the invaders, cooler heads prevailed, and a bloody Hungarian massacre was avoided. Those who died were escorted to their graves by large numbers of the populace, and their burial plots were heaped with floral offerings of respect.

This first reaction to the Soviet presence was completely spontaneous. Indignation, disgust, and anger were vented against bewildered Russian soldiers who were totally dumbfounded at their bitter reception. As the tanks rolled into the city, they were met along the route by large pictures of the Czech leader Alexander Dubcek and thousands of people proudly displaying the tricolor emblem of their national colors and carrying the Czechoslovak flag. They also vocally chastised the invaders, calling out to them to go home and asking why they were in Czechoslovakia. The younger Czechs were more impetuous; school-age children took to hurling stones. In one instance an old man showed youngsters how to disable a tank on the move by inserting a paving stone between the treads and the cogwheels of the tank.¹⁶ Older students pierced the external fuel cans on the rear of tanks and ignited them with burning shirts.

By the next evening improvised spontaneity crystallized, and scattered, rudimentary

organized efforts came into being. Clandestine radio transmitters began operating—there were even clandestine television broadcasts. Underground newspapers also made their appearance. The television and radio broadcasts called on the people to show their solidarity, to act—but to avoid violence.¹⁷ Underground newspapers, printed by students on mimeograph, also indorsed this theme. By the second day of the invasion, 14 “freedom” papers appeared on the streets. They published photos verifying Soviet violence and Czech deaths. They included burning buildings, shot-scarred walls, and burning Russian tanks. These papers were eagerly distributed by the ordinary citizen in the streets, on street cars, in the public squares. In themselves, they were open demonstrations of popular defiance by the great mass of the population.¹⁸

Later the secret radios announced the imminent arrest of Czech leaders and the impending seizure, on a large scale, of prominent people—giving their names: journalists, writers, lawyers, intellectuals, and party officials. The citizens were asked to take down street signs and remove house numbers and door nameplates throughout the city—and this was done within hours. The Russians were then faced with the frustrating experience of asking Schweik for directions and receiving cooperative but baffling instructions that invariably led them someplace they did not want to go.¹⁹ In an effort to counteract the influence of the radio transmitters and locate the broadcasting points, the Russians dispatched teams of electronic specialists with direction-finding and jamming equipment. Railway workers were asked by Czech radio to delay their arrival. Soon railway station names were missing, changed, or destroyed. The trains carrying the equipment were misrouted, delayed, and finally lost.²⁰ The Soviets were finally forced to fly the needed equipment into the country. The radio also reported the license numbers of automobiles the Soviet secret police were using, and the vehicles were trailed throughout the city. When the Soviets made an arrest, their cars were surrounded, prisoners released, drivers beaten.²¹

As the Czechs were quick to realize, how-

ever, violent resistance in their particular situation could only result in a Hungarian-type slaughter. Accordingly, the instructions of their leaders to avoid physical acts against the occupying troops were followed. Passive resistance and whatever other channels were open to them to register their desires were to be the order of the day. In one case the people united against a leader preferred by the Soviets by endorsing their own candidate for office through petitions and resolutions supported by labor groups, youth organizations, and the Academy of Sciences.²²

In another case, not in keeping with normal channels of protest but a part of the contemporary world, a 21-year-old student set himself afire in a protest for freedom. His act of self-immolation was duplicated by a brewery worker and later by three others of diverse occupations.²³ At the site of the student immolation, the red, white, and blue Czech flag and a mourning flag were placed along with floral wreaths and candles. Thousands of people joined the funeral procession. They carried his picture, and many wore their Czech badge of courage: the tricolor ribbon of the Czech flag on their clothing.²⁴

RADICAL expressions of this type have diminished somewhat, but their threat is still present. The Czechs have reverted to their more familiar form of dissent through humor, and when the opportunity presents itself, they engage in more active expressions. The occasion of the Czech victory over the Soviets in the championship ice hockey games resulted in numerous demonstrations and some damage to Russian property. The Soviet airline offices in Prague were sacked, Russian flags burned, and Russian barracks window-screens gashed.²⁵ Russian soldiers are still being exposed to graffiti such as "The Russian circus is back in town." "Do not feed the beast." "Try Soviet paralysis—it's the world's most progressive." "Go home Ivan—the Chinese are there."²⁶

So far, Russian reaction to these pinpricks has been restrained to the point of ignoring

them completely. The Soviets are not chancing any angry reactions. They are playing a very cautious, behind-the-scenes game. Face-to-face confrontations with the Czechs are assiduously avoided whenever and wherever possible. Soviet troops and tanks are hidden on the outskirts of town, and Russian visibility is held to a minimum. Their strategy is plain: replace the Czech leadership with men under their control, and then use this leadership to regain Communist Party domination of the country. In this process, total and rigid control will be reimposed on the country through a Communist Party completely subservient to Moscow. Another Hungary is to be avoided—if possible.

The ordinary Czech, however, still retains the essence of Schweik. He clearly understands this ploy and realizes that his present government is at best helpless, a prisoner to Soviet demands, and at worst is completely under the thumb of Moscow. In this situation the Czechs will revert to the psychology they developed under the Austrians, refined under the Germans, and are now updating under the Russians. They will play the role of the mistrusted minority to the hilt. This role, however, is fraught with danger. How often and how hard can one tweak the nose of the Russian bear before he snaps? At what point will the humorous Schweik suddenly change from passive to active resistance, and, if he does, what will be the extent of the Russian reaction? The older Czechs have walked this tightrope before, and if history repeats their experience under the Austrians and Germans, a transitional point will be reached. In today's Czechoslovakia this point may be reached much sooner than in the past. From all indications, the older Czechs have been extremely successful in transferring their experience gained under German domination, along with the Schweikian national spirit, to the young. Bright, brash, impetuous youth has already developed new techniques, and as the opportunities arise, they demonstrate their ingenuity and courage. Their escalation of Schweikian tactics may not be tolerable to the Russians indefinitely. This has not seemed to deter them, and demonstrations continue.

And the Soviet reaction continues to be restrained. Russian response to the ice hockey debacle was minimal—no forcible imposition, massive repression, or military restraint on the population. Instead, Soviet pressure was applied through the Czech government, using the threat of suppressing future demonstrations by force and demanding action by the Czech government. After the Soviets dispatched an additional 45,000 troops into the country, demonstrators were denounced by the government, and those arrested were tried and convicted. Appeals were also made to the masses to desist, and the people were warned of possible reprisals.²⁷

The Soviets' reaction not only underscores their strategy but also emphasizes the horns of the dilemma they have created. The Communist philosophy that demands clubbing the faithful back into the party fold runs counter to the necessity of avoiding any repetition of the Hungarian bloodbath. How does one enforce Communist discipline on a recalcitrant population determined to exercise nonviolent resistance on a national scale? How does one combat nonviolent action or cooperative non-cooperation? And does a provoker lightly club

or flail about indiscriminately? Schweik was arrested by the Austrians when he shouted, "Long live Emperor Franz Joseph," because it was inconceivable to them that he meant it. The Germans erased two villages, Lidice and Lezaky, and all their inhabitants from the face of the earth because Reinhard Heydrich, the Reich-Protector of Bohemia-Moravia, was assassinated.²⁸ Neither of these reactions brought about the desired results; the Austrians failed to retain the Czech regiments, and the Germans failed to suppress Czech resistance.

Any attempt to suppress the Czech national spirit will incur an ever expanding body of resentment. This may be expressed in witty slogans painted on walls, funny jokes about Russian stupidity, or popular demonstrations to extol national pride. Any Russian retaliation will increase bitterness, and bitterness, in turn, generates hostility. The cycle is in motion, and the results are unpredictable. Two facts, however, remain quite clear: Schweik is ingeniously irrepressible, and Soviet Communism is insensibly suppressive. A clash seems inevitable.

Air War College

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Books and Ideas

HITLER'S FATAL MISTAKE

DR. DONALD S. DETWILER

SINCE the late President Eisenhower's valedictory warning against the military-industrial complex, the question has been repeatedly raised whether our country is not being transformed into what one United States Senator has called "a warfare state." Trapped in an inexorably rising spiral of costs for ever more sophisticated weaponry, we may well find that whatever can be saved by a tapering off or even gradual cessation of expenditures in Vietnam will be claimed in the effort to recover lost ground in a number of defense programs all but starved for funds by the twin struggles in Southeast Asia and in our socioeconomically disintegrating urban centers.

The problems involved in the allocation and control of national resources are staggering. The intrinsically difficult process of decision-making is further complicated by the complexity of our governmental structure. Small wonder that many competent and responsible officers express apprehension regarding the future. Yet as frustrating as the problems are which confront our planners and

decision-makers today and tomorrow, and as unprecedented as they are in their technological details and ultimate implications, in historical terms they are not entirely unique. History rarely repeats itself in a predictable way, but at times there is a haunting similarity of pattern between events past and present. Most of us, at one point or another, have felt an uncanny sense of familiarity when viewing a completely strange scene or watching a course of events the outcome of which we somehow already seemed to know. This was my experience when first learning of Georg Thomas, and I would be surprised if it were not shared by a number of readers of this article, for as different as the world of that German general was from ours, his story has elements and implications which give it a certain elusive yet undeniable relevance to our own times.

Born in 1890 in a small Prussian city on the Neisse, the son of a manufacturer, Georg Richard Thomas received his army commission in 1910. He had a distinguished combat record in the First World War, receiving four

major decorations including the coveted Knight's Cross with Swords (*Ritterkreuz mit Schwertern*). He served in the elite hundred-thousand-man postwar army to which Germany was limited by the Treaty of Versailles. He was a colonel by 1934, brigadier general by 1938, and major general as of 1 January 1940. On 1 August the same year he reached three-star rank as *General der Infanterie*. He had joined the Economic Staff in the 1920s when it was still under the Army Ordnance Office, becoming its head in 1934 when it was detached from the army and given supra-service status in the Reich Defense (*Reichswehr*) Ministry. By 1942 he was head of a greatly expanded Defense Economy and Armaments Office (*Wehrwirtschafts- und Rüstungsamt*) in the Armed Forces High Command (*Oberkommando der Wehrmacht*, or simply *OKW*), commanding hundreds of military-economic agencies stretched across Hitler's *Festung Europa*. But at the beginning of 1943 he was relieved of command and relegated to the impotent status of economic adviser to the chief of the *OKW*, Field Marshal Wilhelm Keitel, a competent enough administrator but completely dominated by Hitler. In October 1944, Thomas was arrested for treason. He had played no role in the attempt on Hitler's life three months earlier but a significant one in the conspiracy against Hitler at the beginning of the war. Long troubled by poor health, Thomas was physically broken by the time he left the concentration camp in 1945. He died in a military hospital the following year at the age of 56.

During the period of almost two years between his relief from command and his arrest, he had devoted himself almost exclusively to compiling a history of the German defense economy and armaments industry since World War I.† Published in 1966 by the West

German Federal Archives under the expert editorship of Professor Wolfgang Birkenfeld, a German authority on the economics of the Third Reich, this 500-page volume is an invaluable detailed apologia for the concept of total war and the policy of economic mobilization, to which Thomas's entire professional career had been devoted but which only began to be realized—far too late to save Germany—under his bitter rival, Armaments and War Production Minister Albert Speer (whose own memoirs, incidentally, have now also been published).

In *Design for Total War*, a recent study which complements the Thomas book, Dr. Berenice A. Carroll has given us a clearly written account of Thomas's ideas in the dual context of the history of warfare and of his attempt to realize them in the Third Reich.†† She had an excellent background for writing this work, which grew out of her dissertation at Brown University. In addition to her formal work at American universities, Mrs. Carroll, who is now at the University of Illinois, spent a Fulbright year in Germany and several years as a member of the staff that catalogued and microfilmed millions of pages of captured German files before their restitution. Her meticulous documentation and detailed knowledge of the labyrinthine military-political-economic bureaucracy of the Third Reich greatly enhance the value of her study of Thomas's, "design for total war." This is not to say that her book duplicates or supersedes such works as those of Klein, Meinck, or Milward, to name only three scholars who have approached the problem of German rearmament and economic mobilization in more general terms than she does in her specialized monograph.¹ She does, to be sure, complement and even correct them on various not unimportant points. But she agrees with them

†Georg Thomas, *Geschichte der deutschen Wehr- und Rüstungswirtschaft (1918–1943/45)*, edited by Wolfgang Birkenfeld, *Schriften des Bundesarchivs* 14 (Boppard am Rhein: Harald Boldt Verlag, 1966), xvi and 552 pp.

††Berenice A. Carroll, *Design for Total War: Arms and Economics in the Third Reich*, *Studies in European History* XVII (The Hague: Mouton, 1968), 311 pp.

in their basic confirmation of the findings of the U.S. Strategic Bombing Survey that the economy of the Third Reich was *not* fully mobilized before 1942, when the Second World War was already half over:

There can be no doubt [according to the October 1945 report on *The Effects of Strategic Bombing on the German War Economy*] that Germany started the conversion of her economy to a wartime footing far too late. Had Germany's leaders decided to make an all-out war effort in 1939 instead of 1942, they would have had time to arm in "depth"; that is, to lay the foundations of a war economy by expanding their basic industries and building up equipment for the mass production of munitions. Starting their armament program as late as 1942, they could only arm in "width"; that is, accept their equipment and material base as given and expand munitions production on the basis of available capacity.²

Germany, in other words, was not economically prepared for total war in 1939 and did not actually begin to convert her economy "to a wartime footing" until 1942. How and why was this the case? There is no serious question that Hitler unleashed the Second World War. It is equally clear that he had envisioned war at least since the twenties, when he wrote in *Mein Kampf* that National Socialists "turn their gaze toward the land in the East" and unambiguously affirmed that the only possible way for modern Germany to survive was to resume the eastward march of the medieval Teutonic knights "in order to provide with the German sword land for the German plow and thereby daily bread for the nation."³ Once he became dictator, moreover, he set about building up the German armed forces. As they became stronger, he conducted a more and more aggressive foreign policy until he finally forced Europe into the Second World War.⁴ But since Hitler so clearly planned for war, why did he not prepare Germany for it? This is the underlying problem dealt with in Dr. Carroll's book about General Thomas, who had so insistently urged adequate preparations that, upon his relief from command in 1943, his superior, Field

Marshal Keitel, explained to him:

I must concede to you today that your warnings and economic judgments before and during the war were correct. But you have made yourself intolerable to the *Führer* and the [Nazi] Party by expressing these views loud and often. Hitler has made clear that he has no use for men who seek continually to instruct him. (p. 232 of Carroll's book, which also is the source of subsequent otherwise unidentified references)

What Thomas had attempted to convey to Hitler—not only in person but through countless memoranda, position papers, and policy recommendations through channels—was his conviction, based on the experience of World War I, that "modern war means total war" and that Germany had to be prepared accordingly. As early as 1928, about a year after the completion of *Mein Kampf*, Hitler's future economic general wrote:

Modern war is no longer a clash of armies, but a struggle for the existence of the peoples involved. All resources of the nation must be made to serve the war; above all, besides men, industry and the economy. (p. 40)

It was to provide a central planning organ for the mobilization of "men, industry and the economy" that the Economic Staff of the Army Ordnance Office, which Thomas had joined in 1928, was transferred, with him as chief, to the Reich Defense Ministry in 1934 with general authority over *Wehrwirtschafts- und Waffenwesen* (Defense Economy and Weapons Affairs). But *Wehrwirtschaft* (a term combining *Wehr*, defense, and *Wirtschaft*, economy) was used by Thomas as a blanket concept to cover economic mobilization in the broadest sense, since "the totality of warfare, which according to modern conceptions is its only possible form, has also led to the concept of total mobilization." (pp. 41-42) Total mobilization, however, could only be achieved and sustained under an authoritarian system, completely subordinating (to use Eisenhower's terms) individual liberty to the military-industrial complex. As Thomas put it in a speech in 1936:

Wehrwirtschaft is the reconstruction of the communal basis of a national economy. It signifies a disavowal of the international principle of individualism. It is the economic principle of a total state and breaks with the liberalism of parliamentary democracy. . . . Only a strong state with strong leadership, a strong economy, and a strong army can maintain its existence among the nations at length. . . . Therefore the first principle of *Wehrwirtschaft* [is] authoritarian and strong leadership of the state. (p. 42)

As the rate of the German rearmament program accelerated, Thomas became increasingly concerned that inadequate provisions were being made to sustain during a long war of attrition the precipitously expanding *Wehrmacht*. In July 1937 he prepared a report for Hitler, warning him, as Dr. Carroll writes, "that the pace of rearmament was outdistancing Germany's economic capacity, and that certain limits would have to be placed upon current military expansion. In particular, Thomas called for a halt in the motorization . . . essential to Hitler's *Blitzkrieg* strategy." (p. 48) In May 1939 the general stated flatly that he did "not believe that a conflict between the Axis states and the Western powers will be a matter of *Blitzkrieg*—that is, a matter of days and weeks. For me . . . the essential thing is to see that our armament is set for all eventualities, including a long war." (p. 48)

Finally, in mid-August, on the very eve of the war, Thomas attempted to avert what he fervently believed would be a catastrophe by insisting to the chief of the OKW, Marshal Keitel, that the impending conflict would inevitably become a long, drawn-out war of attrition which Germany could not possibly survive. As Thomas later recounted, Keitel cut him off with the assertion "that Hitler would never bring about a world war. There was no danger at all, for in Hitler's opinion, the French were a degenerate pacifist people, the English were much too decadent to provide real aid to the Poles, and finally, America would never again send a single man to Europe in order to pull the chestnuts out of the fire for England, or even for Poland." (p.



Georg Richard Thomas

191) When Thomas objected that experts on those countries would never agree with that statement, Keitel snapped back that the general evidently had let himself become infected by "those pacifists . . . who refuse to see Hitler's greatness." (p. 191) Yet as late as 27 August, Thomas objectively demonstrated to Keitel with a series of charts the long-range economic superiority of the Western powers. Keitel was impressed enough to go over the charts with Hitler, but returned them the next day saying that the *Führer* was not the least concerned, particularly in view of the pact he had concluded with the Soviet Union during the past week.

When the war began a few days later, Hitler not only refused to give the orders Thomas urged for full wartime mobilization

of the economy but even hesitated to establish fixed priority schedules or stable production guidelines within the framework of existing directives. Only on 7 September 1939 did Hitler set up, on Thomas's urgent recommendation, a priority schedule, giving top classification to munitions and replacement of destroyed weapons and equipment. But then on 4 October he revised this to include, at equally urgent top priority on a competitive basis, a number of additional programs, including submarine construction, which had not even been on the prior schedule—though the submarine force was so weak that during the early part of the war it was hardly possible to keep a dozen U-boats at combat station in the Atlantic. On 10 October, however, Hitler suddenly established super-priority (over the previous top-priority programs) for motorization; and in mid-November, just as German industry was being retooled for that latest shift, he gave super-super-priority to munitions production—a decision forced by the alarming shortages resulting from Germany's having entered the war, despite Thomas's repeated warnings, with only a four- to six-weeks' supply of ammunition.

Thomas spoke out against these conditions with a vehemence which demonstrates a freedom of expression within professional circles which we do not generally associate with the Third Reich. "There reigns today in Germany a war of each against all," he said in October 1939 at a conference with representatives of the Ministry of Economics and the Army Ordnance Office. "Neither the supreme leadership [i.e., Hitler] nor the commanders of the army understand the present situation. Of course, that would be too much to ask." Hardly less mordant were his remarks to a large audience of industrialists in November, in which "doubting Thomas," as he was known, complained that Germany had no war economy for political reasons which were "very likely based on the delusive hope of the German people that the war might be over by Christmas." The source of such "delusive hopes" he knew, of course—even before receiving Keitel's assurance several days later that the great winning blow was going to be

delivered by Christmas. (pp. 209–11)

The lack of a coherent *Wehrwirtschaft* program with effective centralized control reinforced Thomas's conviction that the economic base would remain far too thin to support the burgeoning German war machine. Since he knew that the consequences would be disastrous for Germany, he was led by his patriotism (and by his religious conviction, as Dr. Birkenfeld shows in his Introduction [p. 25]) to lend his full weight, during fall 1939 to spring 1940, to the unsuccessful plot against Hitler. That conspiracy has only recently been given the historical treatment it deserves—by Professor Harold C. Deutsch of the University of Minnesota, who was attached to the Office of Strategic Services (OSS) during the war and at its conclusion had the opportunity to interview Thomas.⁵ Because it was possible for the plot to be abandoned without being compromised, Thomas maintained his position in charge of the *Wehrwirtschafts- und Rüstungsamt* in the Armed Forces High Command (*Wi Rü Amt/OKW*) until after Hitler appointed his architect, Albert Speer, as Reich Minister for Weapons and Munitions. Speer, an unusually able, hard-driving man who as a personal friend enjoyed the confidence of the *Führer*, immediately began to consolidate control over the war economy. At the time of his appointment in February 1942, there were no fewer than five supreme Reich authorities with conflicting and competing jurisdiction over German war production: Göring's Four-Year-Plan organization, Thomas's *Wi Rü Amt/OKW*, the Ministries of Labor and of Economics, and Speer's own ministry—not to mention the Air Force Ordnance Office which under Göring's patronage remained independent of the *Wi Rü Amt*, Himmler's SS Main Office of Economics and Administration, and several Nazi Party satrapies jealously guarded by Hitler's sinister Party Chancellery chief, Martin Bormann.

In the course of 1942–43 a significant measure of consolidation and centralized control over the economy, such as Thomas had been advocating since the twenties, was finally imposed—but by Speer, who with Hitler's support was able at least to hamstring some of

his rivals and altogether to eliminate Thomas, whose *Wi Rü Amt* was first eviscerated and then dissolved. As the military catastrophe he had so clearly prophesied approached inexorably and the cities of Germany fell in ruins, the general withdrew with his staff to the idyllic residence of Count Arnim in Lusatia to write his history. It was virtually completed at the time of his arrest, 11 October 1944.

Meanwhile Speer instituted those "changes in the institutional framework of the German war economy which made possible the brilliant success of German war production between spring, 1942, and summer, 1944, and so confounded Germany's opponents."⁸ In the words of the Strategic Bombing Survey:

Production of armament in 1943 was on the average 56 percent higher than in 1942, and more than twice as high as in 1941. . . . Despite the damage wrought by air attack and territorial loss, and despite the general drop in production in the second half of 1944, total industrial output for the year was the highest in the war.⁷

What was possible under the adverse conditions of July 1944, when the index of munitions output peaked at 322 (the monthly level of January-February 1942 being taken as 100), suggests what *might* have been achieved had General Georg Thomas's program of comprehensive economic mobilization for total war been taken seriously during the thirties. But *Hitler did not believe in total war* and had no intention of becoming involved in it. Thomas's experience in World War I taught him, the professional soldier, that Germany absolutely had to be better prepared for an extended war of attrition next time. But Hitler, the political fanatic, came to an entirely different conclusion on the basis of the same evidence. He explained his position in a conversation during the early thirties with Dr. Hermann Rauschning, who was then Nazi Senate President of the Free City of Danzig but who later went over to the opposition, emigrated, and published what Hitler had said: "Whoever experienced the war at the front will not want to cause more bloodshed if it can be averted."⁸ And Hitler planned to avert it:

Who says that I will begin a war like the fools of 1914? Aren't we doing everything we possibly can to prevent just that? Most people have no imagination. They can visualize what is coming only in terms of their own limited experience. They do not see the new and surprising. The generals are also sterile. They are trapped in their own professional expertise. The creative genius is always an outsider so far as the professionals are concerned. I have the gift of reducing the problems to their essential core. . . . What is war but cunning, swindle, delusion, assault and surprise? People have resorted to killing only when there was no other way to get ahead. . . . There is such a thing as strategy in an extended sense; there is war with intellectual means. What is the object of war . . . ? That the enemy capitulate. Once he does that, I have the prospect of destroying him entirely. Why should I demoralize him militarily when I can do it more cheaply and effectively in other ways. . . .

When I wage war . . . , one day in the middle of peacetime I will have troops in Paris. They will be wearing French uniforms. They will march through the streets. No one will stop them. Everything is prepared down to the smallest detail. They march to the General Staff Headquarters. They occupy the ministries, the parliament. Within a few minutes France, Poland, Austria, Czechoslovakia are robbed of their leading men. An army without a general staff. All political leaders taken care of. The confusion will be unprecedented. But long since I have been in touch with men who will form a new government—a government which suits me. We find such men. We find them in every land. We do not have to buy them. They come on their own. Ambition and delusion, party strife and intrigue drive them. We will have a peace treaty before we have war. I guarantee you, gentlemen, that the impossible will always succeed. The most improbable way is the surest.⁹

It was precisely by such revolutionary techniques of "peaceful" warfare that Hitler was able to seize Austria, then the Sudetenland, and finally Czechoslovakia and the Memelland without resorting to overt hostilities in the traditional sense. It is true that he had



Albert Speer

to risk war, but the very fact that he was not bluffing and was willing to fight made it unnecessary for him to do so. However, when it came to the next step, Poland, the showdown could no longer be deferred. Yet even here Hitler was true to his revolutionary principles. He had no intention of waging a long war of attrition. His strategy was the very opposite of total war as Thomas understood it; it was *Blitzkrieg*, literally "lightning war." He described it in the course of the conversation already cited:

I will never begin a war without the certainty that a demoralized enemy will collapse as the result of a single gigantic blow. . . . Aerial bombardment on an unheard-of scale, surprise attacks, terror, sabotage, assassinations from within, the murder of leading men, overwhelming assaults on all weak points of the enemy's defenses, instantaneously, at the same moment, without regard for reserves or casualties. That is the future war.¹⁰

Here, as before, Hitler had his way. He completely upset the calculations of his enemies by his pact with the Kremlin. The Poles never had a chance. The French, already internally divided, became seriously demoralized and collapsed in six weeks, while their British

allies were driven back across the Channel. In less than a year, Hitler was master of the Continent from the Pyrenees to beyond the Vistula. Then, on 22 June 1941, the first anniversary of the French capitulation, he turned on his Soviet treaty partner with Operation Barbarossa, *Blitzkrieg* on so vast a scale that Hitler was almost right in his prediction that the world would hold its breath. By the end of September, with victory in sight, "the greatest war lord of all times" actually went so far as to order a substantial reduction in armaments production. Only the bitter stalemate before Moscow itself and the formal entry of the United States into the war brought home to Hitler, at the end of 1941, that his astounding series of triumphs by armed diplomacy, coercion, subversion, and *Blitzkrieg* had finally come to an end and that he was now indeed engaged in a second world war, a long war of attrition, and a war for which he had deliberately and resolutely refused to prepare the Third Reich because he had neither wanted it nor thought it would be necessary. That had been Hitler's fatal mistake. Deluded by his own extraordinary successes, the half-educated Austrian immigrant, who had emerged from anonymity to rule Germany and tyrannize Europe, was ultimately too much of a dilettante to make responsible provisions for a turn of fate against his fanatical and phenomenally successful will. He regarded himself as the instrument of destiny, and consequently, moving with the self-confidence of a sleepwalker (as he himself put it), he felt himself to be virtually infallible. His decision against Thomas's design for total war had been irrevocable, for not even the genius of Albert Speer could recapture the lost years of preparation. Consequently the German armed forces, though they did pack a tremendous initial shock against even less adequately prepared opponents, simply lacked the armaments in depth and overall military-economic support which might have been decisive in the long run. I do not say they automatically would have, but it can certainly be argued that this mistake alone was sufficient to cost him whatever chance of victory he might have had.

How many more tanks would have been needed to bring about different outcomes in the battles of Moscow, El Alamein, and Stalingrad? How many more submarines could Britain have withstood during those first two years of the war? How much sooner could Germany's jet aircraft have been brought into mass production, and what difference would it have made? These are all disturbing reflections, but more disturbing still is the thought of what might have happened had the man who split the atom gone on to develop the atomic bomb. The fear that this might happen had triggered President Roosevelt's decision in favor of the Manhattan Project. I will never forget Otto Hahn, who received the 1944 Nobel prize in chemistry for his world-shaking discovery of atomic fission in 1939. I met him while a student at Göttingen a few years before he died, and he movingly described the stance which he and his associates took on the issue: Early in the war they had assured the leaders of the Third Reich that it would theoretically be possible to develop the bomb but that to do so would require virtually unlimited support in terms of priority materials and highly skilled personnel in many fields. Moreover, they had added, no definite assurance could be given that a practical weapon would be developed in the relatively near future. Still thinking in terms of *Blitzkrieg*, Hitler was willing to give serious support only to projects that promised concrete returns within a year. Consequently, the German effort to produce the atomic bomb was carried on in a desultory and uncoordinated fashion by a number of agencies, including even the postal ministry. Nothing came of it, for as Max von Laue, another Nobel laureate, at the time assured a foreign friend who was shocked to learn of the German scientists' "effort" to develop the bomb: "No one ever invents anything he doesn't really want to invent."¹¹ Since the *Führer* was uninterested, nobody cared.

MY POINT of departure for this review article was the agonizing question in our own time of the allocation and control of national resources in view of the conflicting needs of

those responsible for our national security in a military sense and those concerned for remedying the socioeconomic conditions in our cities which are eroding the very fabric of our national life.

Clearly the national goals, problems, and alternatives of the United States on entering the seventies are so different from those of Germany in the thirties that any attempt to draw meaningful parallels must be very carefully defined in order to avoid oversimplification or misrepresentation. But in evaluating the significance and relevance of General Georg Thomas's design for total war and of his and Dr. Carroll's fine books, I consider it both valid and important to make three points.

The first is that the story of what Thomas stood for and tried to do, and of Hitler's negative response, is intrinsically vital to our understanding of the Second World War and its large part in shaping the world in which we live. It has been said that knowledge is power. In some respects this undoubtedly is true, but it is often much harder to argue convincingly than merely to assert. Personally, I consider it unnecessary to rationalize in practical terms my desire to understand the present and the past. I trust the reader will accept as my first reason for writing this story the fact that it is worth retelling for its own sake.

The second point I want to stress is that neither Adolf Hitler nor Georg Thomas was entirely correct or entirely mistaken in his vision of the coming war. The professional soldier, despite his brilliant comprehension of *Wehrwirtschaft* and the necessity of radical economic mobilization for modern total war, seemed simply unable to grasp the revolutionary significance of Hitler's innovations that contributed so much to the German successes in the first two years of the war. Hitler, for his part, did not understand that those dramatic victories took place within a larger frame of reference which he could not change either by the force of his will or by the power of his *Wehrmacht*. Thomas was too conservative, but in the last analysis his conservatism rested on sound principles and insights which Hitler ignored. This, as we have seen, was a fatal mistake.

My third point touches not only on the significance of this article and the story it tells but also on the relevance of history to the present and future. It could be dangerous for us to think in terms of learning any positive lessons from the history of General Thomas, his program, and his fate. To put it differently, as interesting as the story may be, it will not help us, in concrete terms, to deal with our own problems today and tomorrow. History may be the teacher of mankind, but its lessons are frequently ambiguous. The great Swiss historian Jacob Burckhardt rightly scoffed at the idea of studying history "in order to be more clever next time." The hazard against which he warned is, in fact, demonstrated in this article by the Hitler-Thomas disagreement. We have seen how, for both of them, the experience of the First World War was the point of departure in preparing for the next conflict. Yet their conclusions were contradictory. Thomas was convinced that Germany absolutely had to prepare far better than pre-

viously for the war of attrition he regarded as inevitable. Hitler thought it unnecessary and undesirable to do so: unnecessary because such a war could be avoided; undesirable because a larger armament program would involve either a cutback in consumer goods or the risk of inflation, neither of which he considered an acceptable alternative. As things turned out, Hitler was right for the first part of the war, Thomas for the latter part—and it was, of course, the latter which counted in the long run. Hence Thomas may justly be celebrated as a prophet without honor in his own country, a distinguished soldier, a brilliant planner, and perhaps even a man who read the lessons of history correctly. But since the policy he advocated was not followed, we cannot be certain. Consequently, the only incontrovertible conclusion we can reach from these considerations concerning the allocation and control of national resources is the ominous observation that in the long run a mistake can be fatal.

Carbondale, Illinois

Notes

1. Burton H. Klein, *Germany's Economic Preparations for War* (Cambridge, Massachusetts: Harvard University Press, 1959); Gerhard Meinck, *Hitler und die deutsche Aufrüstung* (Wiesbaden, Germany: Franz Steiner Verlag, 1959); Alan S. Milward, *The German Economy at War* (London: University of London, Athlone Press, 1965).

2. The United States Strategic Bombing Survey, *The Effects of Strategic Bombing on the German War Economy* (Washington, D.C.: U.S. Government Printing Office, October 31, 1945), p. 7. Hereafter referred to as USSBS.

3. Adolf Hitler, *Mein Kampf* (41st ed.; Munich: Eher-Verlag, 1933), pp. 742 and 154 (my translation).

4. As discussed in my article, "The Origins of the Second

World War," *Air University Review*, XX, 5 (July-August 1969), 94-102.

5. Harold C. Deutsch, *The Conspiracy against Hitler in the Twilight War* (Minneapolis: University of Minnesota Press, 1968), pp. 265-69, 308-15, 392, etc.

6. Milward, p. 72.

7. USSBS, p. 26.

8. Hermann Rauschning, *Gespräche mit Hitler* (Zürich: Europa-Verlag, 1940), p. 15 (my translation).

9. *Ibid.*, pp. 12-13 (my translation).

10. *Ibid.*, p. 16 (my translation).

11. Robert Jungk, *Brighter than a Thousand Suns: The Story of the Men Who Made The Bomb* (New York: Grove Press; copyright, Harcourt, Brace & World, 1958), p. 94.

PANZER SPRING: MAY 1940

Fifty million Frenchmen can't be wrong.

Texas Guinan

THE French have a word for it—*débâcle!* In May 1940 France suffered an ignominious defeat at the hands of Hitler's Germany.

ROBERT M. KIPP

Possessing all the high drama natural to such an event, the fall of France has attracted a number of writers the last 30 years. None has

been more successful than the English author Alistair Horne. *To Lose a Battle: France 1940*† is the last volume of his trilogy dealing with relations between Germany and France during the last century, a rivalry which he has called "the root of evil in the world I grew up in."¹ The cast of characters and the locale are European, yet the book will be read with interest by Americans who from the sidelines that spring watched the unfolding of one of the most brilliantly planned and executed military campaigns in history.

Horne's book is divided into two parts: the first has to do with the interwar years 1918–1939 and the events leading up to the German invasion of France in 1940; the second deals with the invasion itself and in particular the crucial days when the panzers cut the country in two and sealed the victory.

The author devotes less than a hundred pages of his 600-page volume to the interwar years. It is a spare account, and some will wish for more detail; still, all the larger issues are there. Horne keeps his attention focused on the issues which he believes had a direct bearing on the outcome in 1940. Lieutenant General Sir John Winthrop Hackett has said that what a nation asks for in an army tends to be a reflection of itself.² France was pacifistic between the wars, clinging to the ideal of the mobilized nation-at-arms as the answer to any future aggression. Horne establishes very well the connection between the chaotic state of the political bureaucracy during those years and the slow ossification of the military establishment. Plagued with governmental instability and an acute lack of leadership, France could devise no workable and long-term strategy for maintaining peace in Europe after it became obvious that the Versailles Treaty would provide only temporary security against a renascent and revengeful Germany. According to the author, well into the post-World War I years France clung to "a series of insidious illusions" concerning her strength and ability to influence affairs on the Continent. These caused her to see the world as

she wished it to be, not as it was. France's late allies returned to their own preoccupations, and there was even a strong feeling that perhaps Germany had been treated too harshly at Versailles. Great Britain and the United States knew well that only through their efforts had the war been won, and they were not prepared to stand by France in peace as in war. France's inability to enforce the peace can be traced directly to the immediate and latent effects on her economy of a war fought largely on her own soil. Her erstwhile allies would not help with her war debts. Germany, defeated and racked by revolution, her currency worthless, could not pay. Horne believes that France's efforts to make the defeated enemy pay "undoubtedly helped to clear the way for the Second World War." (p. 17)

Yet one has the inescapable feeling that, with a strong hand at the helm, France still could have averted tragedy. Her wartime political leaders were old and dying out in the twenties. Many who would have naturally risen to power either were killed in the war or had been made mentally and physically unable to accept the burdens of public life. There were few clear issues and causes to polarize public interest now that the Boche had been defeated and Alsace-Lorraine returned. Special-interest groups multiplied, pulling politicians this way and that. Parties splintered, making it difficult for any one of them to stay in power long enough to carry out a specific program of reform. Instability in the 1920s was a product of internal problems principally having to do with the budget. It was in her relations with Germany, however, that this "mad game of musical chairs" had its most serious implications for France's future. Alternating between threats of force and offers of conciliation, France added to the already large store of distrust and bitterness existing in Germany. What concessions she did make, such as leaving the Rhineland five years early, were interpreted across the Rhine as signs of weakness. "By 1931 Germany was like the genie in the bottle who, instead of

†Alistair Horne, *To Lose a Battle: France 1940* (Boston: Little, Brown and Company, 1969, \$12.50), xxiv and 647 pp.

showing gratitude to his innocent liberator, slew him in requital for his prolonged sufferings." (p. 21)

After the victory of 1918 French military thought remained transfixed by the experience of four years of static warfare on the Western Front. Experience taught that the nation's vulnerable eastern frontier must be protected from invasion. While the army occupied the Rhineland, France was secure. Should Germany attack again, and this was considered highly unlikely at the time, the early battles would be fought on German soil and the time gained would be used to mobilize the reserves. This advantage was, of course, lost when France began to withdraw from the Rhineland in 1929. By then plans were ready for creating a series of fortifications along the eastern border. In case of another war such forts would preserve French lines and prevent another desecration of the motherland. The decision in 1930 to go ahead with construction of the Maginot Line and the consequences arising from that decision are most important to an understanding of what happened to the French Army ten years later. The Maginot Line came to symbolize the character of the army—indeed, the French national mind. The author explains:

Rapidly the Maginot Line came to be not just a component of strategy, but a way of life. Feeling secure behind it, like the lotus-eating mandarins of Cathay behind the Great Wall, the French Army allowed itself to atrophy, to lapse into desuetude. A massive combination of factors—complacency, lassitude, deficiencies of manpower and finance—combined to rust the superb weapon the world had so admired. . . . (p. 32)

In the shade of the Maginot Line new ideas of warfare could scarcely take root, much less flourish. The author believes that the failure of the French Army to assess correctly the effect on future warfare of the introduction of the tank in the late battles of 1918 was mainly responsible for the defeat of 1940. While Germans such as the future panzer leader, Heinz Guderian, pored over the works of Liddell Hart, the British prophet of mobility, the hidebound French General Staff

continued to maintain that the true function of the tank was to assist the advance of the infantry. There were some junior officers in the army eager to accept new ideas. Liddell Hart mentions in his *Memoirs* meeting with a group of them in Paris in 1935. He also purchased during that trip Charles de Gaulle's book *Vers L'Armée de Métier*, which had attracted little attention.³ André Beaufre, one of those who met Liddell Hart in Paris, recalls what a disquieting effect the reading of that Englishman's *Decisive Wars of History* had on him when he was a student at the *École de Guerre*: "These basic truths [dealing with the strategy of the indirect approach] the ignorance of which [in the French Army] shocked me, clearly added to the malaise which we felt at seeing the high command refusing to take any steps toward modernizing the Army."⁴ So youth did not have its day in the French Army between the wars. The old guard, still holding the reins of power, designed the army, in Liddell Hart's words, ". . . as a slow-moving steamroller of fire . . . to push back gradually, as in 1918, a similar army . . . aligned against it."⁵ When the question of creating an armored corps finally did come up for debate in the Chamber of Deputies in 1935, the Minister of War voiced the belief of most present when he said: "How can we still believe in the offensive when we have spent *milliards* [billions] to establish a fortified frontier? Would we be mad enough to advance beyond this barrier upon goodness knows what adventure?" (p. 36)

The great fallacy in this kind of thinking was that Germany was not planning to have the same kind of army in the next war as she had in the last. Admiral Mahan has said: "Defeat cried aloud for explanation; whereas success, like charity, covers a multitude of sins." Defeated in 1918, stripped of its arms, and reduced to 100,000 men by the Versailles Treaty, the German Army lacked everything but good leadership. Colonel General Hans von Seeckt, a remarkably talented Prussian visionary, guided the *Reichswehr* during the difficult early postwar years. His experience on the Eastern Front during the war turned him toward an examination of the possibilities of mobile warfare. Seeckt also displayed a

keen sense of the value of air forces when he insisted, against the complaints of ground officers, that a number of former pilots be included in the select new army. Within four years after the end of World War I the *Reichswehr* commander had already concluded: "The future of warfare appears . . . to be in the employment of mobile armies, relatively small but of high quality, and rendered distinctly more effective by the addition of aircraft." (p. 47) The *Reichswehr* showed great ingenuity in exploiting loopholes in the Versailles Treaty. On maneuvers the army pushed dummy tanks around. Tracked vehicles were prohibited, but the Germans experimented with motorcycle companies and eight- and ten-wheel armored cars. Not permitted airplanes, air enthusiasts turned to gliding. In the twenties, in accordance with a secret clause of the Rapallo Treaty, the Germans began testing tanks in Russia at Kazan and opened a flying training and aircraft test center south of Moscow. When Seeckt retired under political pressure in 1924, he left a legacy of solid doctrine and high technical ability in the *Reichswehr*. He had held the army together and turned its attention to new kinds of warfare. It is hard to imagine that the German Army could have achieved what it did in 1940 had there never been a Hans von Seeckt. It is equally hard to imagine that Germany would have attempted what she did in 1940 had there never been an Adolf Hitler.

Hitler created the new German *Wehrmacht*. He was quite receptive to the theories of mobile warfare. In *Mein Kampf* he said that motorization would be decisive in the next war. The panzer attack fitted perfectly with his political theories of lightning conquests using minimum force. War as he had personally experienced it on the Western Front was to be avoided at all cost. "I shall maneuver France right out of her Maginot Line without losing a soldier," he boasted. Hitler encouraged the army to develop new weapons to fit its revolutionary doctrine. He also gave the *Wehrmacht* the revolutionary spirit of Nazism to go with that doctrine. The "New Order" inculcated in the youth of Germany a radical spirit of patriotism and com-

radeship. The educational system was based on physical culture and discipline. As Horne explains: "By the time they reached the *Wehrmacht*, these Spartan, dedicated youths were already superlative material for a 'revolutionary' force, instinctively versed in the one craft which was to pay off in Germany's early military operations more than any other: teamwork." (p. 53)

Hitler's bloodless conquests between 1936 and 1939 are sketched briefly by the author as he hurries on to the main thrust of his book, the invasion of France. This is not disappointing. Because of the particular fascination these years have had for historians, the story has been told before, often and well. The reoccupation of the Rhineland in 1936 was a daring act carried out by a still weak *Wehrmacht*. We know now that for the German generals, and for Hitler, this was a very anxious time. What a determined show of strength by the French would have accomplished then can only be speculated upon, but the odds for its being successful would never be as good again. France's allies opted out. The French cabinet, gathered to consider the situation, was told by the Minister of War that any reaction would involve risk and that the state of the army did not permit taking risks. The chief of staff, General Maurice Gustave Gamelin, reported that any move against the German occupation would require mobilization. The ministers considered that signing such an order was tantamount to signing their political death warrants. France did nothing. Neither did it move when Austria was annexed. In turn, the Czechs were abandoned. When war did come a year after Munich, France ironically found herself following the lead of her ally Great Britain in defense of the Poles. She went to war ". . . with no allies but Great Britain and Poland; Belgium neutral and the Maginot Line incomplete . . . ; her army strong on paper but weak in fact; her air force hopelessly outclassed; and the nation divided." (p. 93) The mobilized army dutifully filed into their bunkers and there sat in splendid isolation while Poland fell before Hitler's panzers.

His flanks and rear secure, Hitler could

now plan what he had referred to in *Mein Kampf* as the "one last decisive battle." He ordered the General Staff to prepare to invade France through Belgium and Holland. Despite its general lack of enthusiasm for such a venture so soon after the Polish campaign, the Army High Command (OKH) prepared within a month Deployment Plan Yellow. It called for an army group to drive northwest to Ghent and Ostend, with the expectation of separating the British Expeditionary Force from the French armies and gaining air bases from which to attack England. Clearly, Plan Yellow did not fit Hitler's conception of a masterstroke, being, in the author's words, "... so conservative and uninspiring that it might well have been thought up by a British or French General Staff of the interwar years. . . ." (p. 140) At Hitler's suggestion, the plan was somewhat revised, and part of the strength of the attack was shifted to the south to cross the Meuse both north and south of Namur, Belgium. Although this still meant attacking the French head on and for only limited objectives, Hitler would probably have attacked in late 1939 had he not been thwarted by bad weather and the opposition of officers high in the OKH.

Two officers who found Plan Yellow unsatisfactory were General Gerd von Rundstedt, commander of Army Group A, and his chief of staff, Lieutenant General Erich von Manstein. Manstein, who the author predicts will come to be rated one of the great generals of the twentieth century, believed that Germany could not afford to attack France again with anything but total victory in mind. In late October he prepared the first of six memorandums signed by his chief, Rundstedt, and in turn sent to the commander of the army, Von Brauchitsch. The Manstein Plan, as it finally evolved through the memorandums, shifted the weight of the armored drive from northern Belgium south to the upper Meuse, near Sedan. Once the panzers had crossed that river and traversed the Ardennes—Guderian had assured Manstein that tanks could move through it—they would sweep northwestward to the Channel. The drive, called *Sichelschnitt* (sickle slice), would cut off the First French

Army Group from the Maginot Line and the armies defending it. Brauchitsch gave the plan a cool reception, but in February 1940 Manstein got an opportunity to explain it to Hitler. The *Führer* took it as his own. Here was a plan such as the one he imagined but had not been able to articulate in detail. Here was a plan to annihilate the enemy and secure the decisive victory. The final disposition of forces, worked out in the meticulous detail which characterizes staff work in the German Army, allotted two panzer corps (five divisions) to Rundstedt for the main crunch on the Meuse. In the north an army group (General von Bock's), with only two panzer divisions, would act as the "matador's cape" (Liddell Hart's phrase) to lure the French and British into the Low Countries and hold them until they were encircled.

When all the reasons for the eventual success of *Sichelschnitt* are considered—the brilliance of Manstein, the inspiration of Hitler, and the solid staff work of the OKH—we must not ignore the contribution of the Allies themselves. To the French General Staff there were two possible invasion routes, the short way across the common frontier and the longer way through Belgium. The Maginot Line protected the common frontier, so the obvious route was through the Low Countries. General Gamelin planned to meet the Germans with a movement of his armies north and east into Belgium and Holland to the so-called Dyle Line. That the Germans in fact intended to take this route in a kind of replay of the Schlieffen Plan of 1914 seemed confirmed in early January 1940 when the French came into possession of top secret plans carried by a German staff officer whose small plane came down in Belgium. With this intelligence in hand the Allies strengthened their forces assigned to the northern flank. These forces now came to include the best of the infantry divisions and most of the French armor and motorized units. In the spring of 1940 the Allies were positioned with a strong right flank on the Maginot Line and a powerful left flank facing Belgium; but in the center, along a front of less than a hundred miles and behind the "impenetrable" forest of the Ar-

dennes, there were only four light cavalry divisions and ten reservist divisions.

In May 1940 the moment of truth arrived for France. Now she would have to pay for the years of political sloth and division, the stringent military budgets, the uninspired military planning, the wasted opportunities. The reluctant French must now fight. The focus of the author's attention is rightly on the breakthrough of the German armor on the Meuse and the subsequent dash westward to the Channel. He switches frequently to goings-on in Belgium and Holland, but it is a sideshow, as the Germans intended it to be. Between 12 and 14 May the panzers struck across the Meuse. The French defenders, although often tenacious, were paralyzed by the volume of fire brought down on them by the combined ground and air attacks. On the thirteenth, General Georges, commander on the Northeast Front, announced to his staff: "Our front has been pushed in at Sedan. There have been some failures . . ." and then collapsed into a chair with a sob. (p. 317) Allied air attacks, carried out by a meager number of aircraft, were too late to influence the battle for the bridgehead. Coming in at low level, they were shredded by a torrent of fire and suffered heavy losses. A British aviator, pulled from the wreckage of his Fairey Battle bomber, was berated by his captor: "You British are mad. We capture the bridge early Friday morning. You give us all Friday and Saturday to get our flak guns in circles all around the bridge, and then on Sunday, when all is ready, you come along with three aircraft and try to blow the thing up." (p. 248) Even had he wished, the British pilot would have been hard pressed to make the German understand the "quagmire of liaison links" which existed between air and ground commanders of the Allied forces.

One French historian has said that France lost the war on 15 May, and that is not an exaggeration. The panzers broke out of the Meuse bridgehead that day. The author tells their story largely through the experiences of Guderian, commanding the XIX Panzer Corps, and Rommel, commanding the 7th Panzer Division (Hoth's XV Corps). These men pos-

sessed in large measure the *élan* once so highly prized in the French Army. They are often with the vanguard of the attack, cheating death, cajoling, threatening, and inspiring their men. Forward! Forward at all costs! Time is the enemy! The French must not be allowed time to regroup their forces and prepare a defense. The panzers were on what Liddell Hart has called "tank time," and the opposition found it impossible to modify its plans accordingly. The French needed a battering ram of armor to pierce the panzer corridor as it grew larger and expanded westward, but pinpricks were all that they could deliver. "Churchill asked Gamelin: 'When and where are you going to counterattack the flanks of the Bulge?' Gamelin's reply was: 'Inferiority of numbers, inferiority of equipment, inferiority of method' and then shrugged his shoulders." (p. 394) The effects of De Gaulle's two armored counterattacks against the corridor (on the 17th and again on the 19th) have, according to Horne, been inflated by the myth-makers: "For the relative impact . . . one is reluctantly reminded of Samuel Johnson's dictum: 'A fly, sir, may sting a stately horse and make him wince; but one is but an insect, and the other is a horse still.'" (p. 429)

On 20 May elements of the 2nd Panzer Division reached the Atlantic Coast at Noyelles-sous-Lens. The danger to the corridor was now acute because a vacuum existed between the armored "tortoise head" and the infantry columns desperately trying to catch up. The next day the British were able to gather together a few tanks and two battalions of infantry to attack south from Arras. They gained about ten miles, took more than 400 prisoners, and destroyed a large amount of equipment. The British also suffered heavy losses and could not hold the ground taken. Still, this feeble prod at Arras imposed a sudden caution on the Germans and directly contributed to the success of the evacuation from Dunkirk two weeks later. Horne dismisses as more myths two popular explanations of why the Germans did not make a greater effort to prevent the evacuation: the Flanders mud stalled the tanks, and the panzers were held off be-

cause Hitler wanted to help the British escape. He lays the blame on Rundstedt, who persuaded Hitler to issue the stop order because of ". . . the shock of what the British had done, coupled with his ineradicable fears of what the French still could do. . . ." (p. 537) On 5 June, the day Dunkirk fell, the German High Command issued a communiqué stating that the second great offensive had begun to destroy the remainder of the French forces to the south. The issue had already been decided, but the killing would go on two weeks longer.

Horne concludes that, although the low morale of the French and the outdated doctrine and equipment of her army were serious weaknesses, it was in the end their inability to stay abreast of the fast-moving battle (again the element of tank time) which was the key to her defeat. Nothing in the experience of the French commanders had prepared them to think and respond at such a pace. German air supremacy, especially the close support work of the Stukas, added to the panzers, gave the recipe for victory:

The odds against France opposing *Sichelschnitt* in 1940 with any successful defense and even allowing for the element of the unexpected—remain enormously high. When all is said and done, the strategic brilliance of the German plan and the tactical skill with which it was executed will always make it one of the classic campaigns of history. (p. 593)

To Lose a Battle is a big book, well organized and well appointed with maps, photographs, reference notes, bibliography, and index. At its price one would not expect anything less. The photos are particularly effective, invariably showing the Germans in the heroic poses of a winner—official portraits of the generals, sappers attacking fortified positions, panzers churning up the dust, the youthful and vigorous infantry singing as they march, even the audacious motorcyclist sprawled dead in a village street—while the French look out with that vacant and glazed expression common to the defeated. One photo not of 1940 vintage somehow slipped in: the bottom picture on page 312 shows German infantry attacking

past burning American equipment during the Battle of the Bulge (see *The Ardennes: Battle of the Bulge*, Office of the Chief of Military History, p. 183). There are no footnotes in the narrative, and the reference notes at the back of the book cite by chapter only the major works used by the author. I am old-fashioned, and this bothered me. I do not suggest for one minute that Mr. Horne has not done his homework; I just prefer full citations.

Like all good storytellers, Horne has a fine sense of the dramatic. He uses extracts from the personal papers and diaries of participants on both sides to give his narrative a "you are there" quality. Rommel receives a great deal of attention, not only because he was an important "mover" in the German attack but also because he kept a diary and wrote his wife regularly. Horne understands, however, that history is not all anecdotes, and he moves the pins around on the battle maps at headquarters well enough to keep the reader from floundering. Horne admits to many problems in piecing together the fast-moving events of those weeks in 1940. The French come in for censure for their misguided attempts to protect the nation's honor—they have produced no official history, and the military archives at Vincennes remain closed to historians. Yet the author remains scrupulously fair, giving due credit to the gallantry which certain units showed during the battle. His narrative perforce leans heavily on German accounts. Telford Taylor before him (in *The March of Conquest*) also made good use of *Wehrmacht* records. I do not envy Horne's descent into the labyrinth of documentation, but I celebrate his emergence with a fine book.

The story of the fall of France has been told before and will be told again, I suspect. When a great nation succumbs, especially under circumstances like those of France in 1940, men will ask why and attempt to find in the answers object lessons meaningful to their own time and situation. This is a perilous endeavor but an all-too-human one. Read *To Lose a Battle: France 1940* for the lessons it offers, read it for the pure enjoyment a good story brings, or read it for both these

reasons. But keep your eye on the human condition. Alistair Horne has been more successful than any other writer to date in dealing with the same subject, in relating how men reacted in the face of challenge. Arnold

Toynbee has said that history does not repeat itself, but men do. Horne reminds us again that much in history which we label inevitable is in fact the product of man's will or lack of it.

Bellevue, Nebraska

Notes

1. Alistair Horne, *The Fall of Paris: The Siege and the Commune, 1870-71* (New York: St. Martin's Press, Inc., 1965), p. xi.
2. Lieutenant General Sir John Winthrop Hackett, "The Profession of Arms," Lees Knowles Lectures, Trinity College, 1962, DA PAM 360-302, p. 34.

3. *The Liddell Hart Memoirs, 1895-1938*, 2 vols. (New York: G. P. Putnam's Sons, 1965), Vol. 1, p. 273.
4. André Beaufre, *1940: The Fall of France* (New York: Alfred A. Knopf, Inc., 1968), p. 40.
5. *Liddell Hart*, Vol. 1, p. 103.

REFLECTIONS FOR FUTURE AIR LEADERS

AIR CHIEF MARSHAL SIR BASIL EMBRY, RAF (RET)

GAVIN LYALL'S recent anthology of stories and verse, *The War in the Air: The Royal Air Force in World War II*,[†] is gleaned from a wide range of sources, literary and nonliterary, including postwar histories, biographies, newspaper articles, and combat and other official reports. It is not a history, as the editor makes clear in his Preface, but a collection of writings from and about British Commonwealth Air Forces in the 1939-45 war. Nevertheless, it has a historical framework, both chronologically and in background references to campaigns, and this undoubtedly enhances its value and general interest as a record of events and the impressions of some of those who took part in them.

It is a book which I recommend for all students of war and future commanders because it is mostly about people and people at

war. It recounts their emotions and reactions in the face of danger; their responses to and experiences of good and bad leadership. It touches on some of those inner and hidden senses of the human mind which, when controlled, give men courage and fortitude in time of peril. It is an understanding of the overwhelming power of these hidden forces pervading the spirit of man which all students of war and commanders should strive to master, because this understanding is the key to high morale and success in battle.

Although this book is not intended to be a treatise on morale, courage, fear, leadership, or any subject dealing with matters of the mind, it provides plenty of food for thought which should be assimilated and stored away in the minds of those who by virtue of their position may have to send young men into

[†]Gavin Lyall, ed., *The War in the Air: The Royal Air Force in World War II*, Volume II of *Freedom's Battle, 1939-45* (New York: William Morrow and Company, Inc., 1969, \$7.95), xv and 422 pp.

action to face the perils of their military mission.

For those who were directly engaged in active operations in the air during the Second World War, the details must be beginning to fade with the passing of years. The thrill of achievement, the moments of anguish and fear, those soul-stirring incidents which revealed courage at its height and beastliness at its depth have had the sharpness taken from them. So I believe it is of the utmost importance that those who study war should spare no effort to try to understand those intangible forces that will influence the minds of young men facing great danger at those crucial moments. Those who understand these things and take sensible cognizance of them in their handling and control of juniors placed under their command have a better chance of developing high morale than those who neglect them.

Never should we forget that morale is the great force influencing the minds of military men which helps them to rise to heights of achievement beyond the grasp of other beings. It is the steadying factor in the crisis of battle and makes men give their all without counting the cost or expecting any return. It is, in fact, the most important single weapon in the armory of a fighting service. Unfortunately morale is never static; it cannot be built up and kept in cold storage until the day it is wanted. It is a force extremely susceptible to outside influence and must therefore be watched, carefully guarded, and constantly sustained. Above all else, it must be built on sound and durable foundations if it is to withstand the shock of war.

My interest in this book sprang mainly from the stories that touched on the emotions and reactions of men in action, some of whom gave firsthand accounts of what happened, how they felt about it, and their behavior. Such accounts are not normally to be found in official histories of war or textbooks on strategy and tactics; yet these powerful impulses that influence men's conduct in the face of danger play an important part in the successful execution of a war operation. There are also a number of stories of absorbing

interest from which useful lessons may be learned. In a short review it is not practical to refer to each, and I have therefore selected four which I believe are especially worthy of comment.

A splendid example of initiative, improvisation, and refusal to accept defeat is told by Air Marshal Peter Wykeham in "Back Every Friday." I cannot do better than quote verbatim from that story:

Wing Commander R. L. R. Atcherley [now Air Marshal Sir Richard] arrived at the British HQ near Narvik to arrange the air support for the next move. The Luftwaffe were now operating from Trondheim, and bombing had already begun. Atcherley, whose dynamism attained almost frightening proportions, borrowed a Walrus amphibian from the Navy, sought for and found two possible sites at Bardufoss and Skaanland, enrolled civilian volunteers by the hundred, and blasted a series of landing-grounds out of the snow, ice and rocks. The work went on for twenty hours a day under conditions of appalling difficulty. Mindful of the lessons of Lake Lesjeskog [where the air base had been set up on the frozen surface of the lake and owing to its exposed position highly vulnerable to air attack], Atcherley and his engineers built taxiways and protection pens, camouflaged positions for aircraft, and air raid shelters for ground crew. Melting snow flooded the works and was repelled again, and when the transport lorries proved inadequate two hundred mules were drafted to help out. (pp. 21-22)

"Dogsbody" by Johnnie Johnston (now Air Vice Marshal J. E. Johnston, retired) tells a great story about the powers of leadership of Douglas Bader, who lost both his legs in an air accident in 1931. By his example, courage, personality, imperturbable character, and skill as a fighter leader, he must stand out as one of the greatest fighter leaders of the RAF to emerge from the 1939-45 war. The story reveals the power and influence of high-quality leadership on subordinates in time of danger and crisis. Johnston sums it up: "What a man!" No doubt Johnston, who became one of Britain's greatest fighter pilots and fighter leaders, came under the influence of Bader when he served in his wing. (pp. 120-30)

"The Battle of the Bay," by Ivan Southall, is a grand story of the individual and collective courage, skill, fighting qualities, and teamwork of an Australian Air Force flying boat crew. Attacked by eight German fighters when flying as a single flying boat patrol, in clear sky, over the Bay of Biscay, they not only repelled all attacks but destroyed six of the enemy aircraft and damaged the other two. Anyone who prizes the quality of courage will be filled with admiration when he reads this story. (pp. 245-53)

"Dresden," by David Irving, is an extract from his book, *The Destruction of Dresden*. This selection consists mainly of operational details of the raid, fairly and accurately reported. But the story left a nasty taste in my mouth because it gives an entirely wrong impression to anyone who has not studied the bomber offensive against Germany in the Second World War and this particular operation at Dresden in relation to the war as a whole. (pp. 382-90)

As regards the decision to bomb Dresden, there is no better source than the official history by Webster and Frankland (Vol. III, p. 98 *et seq.*). It was part of a coordinated Anglo-American offensive against Berlin, Leipzig, Dresden, and Chemnitz to help the Russian advance. The British Prime Minister and the President of the United States, too, I believe, took a personal interest in the proposal, which was discussed with the Russians at Yalta.

It must be admitted, of course, that Dresden was the loveliest rococo city in Europe, and there were many refugees from other bombed-out centers in and around it. But never let it be forgotten that it was of considerable military importance in that it was a main center of communications in the southern half of the eastern front, and therefore its destruction was in direct support of the Russian offensive. RAF Bomber Command's initial attack was by 800 aircraft, and this was followed by attacks by U.S. bomber forces of 400, 200, and 400 aircraft.

War is a ruthless, vicious, and merciless affair, but it was the Germans who started it

in 1939, not the Allies. It may be said that Dresden paid the price and had to be destroyed, but that is war and those who start it have to take the consequences. Let us not be sentimental and try to make a case in retrospect condemning an operation that was carried out in line with higher strategy, the object of which was to hasten the successful conclusion of the war.

It is difficult to refute the statement that the crews were unhappy about this particular operation, because in any big organization there will always be a few who are unhappy, even if it is a pay raise—they will argue it is not big enough. But a very thorough examination of the records of all squadrons that took part in the raid gave no hint of discontent or undue concern.

Certain people, whom I believe to be misguided, go to great lengths to condemn the bomber offensive against Germany and belittle its contribution to victory. Why I cannot imagine when records, both Allied and German, prove that it shortened the war considerably and saved countless American and British lives which would otherwise have been sacrificed had the struggle been decided on land alone and had there been no bomber offensive to bring about a complete breakdown of German munitions production and fuel supplies and an almost one-hundred-percent disruption of land communications.

In any community there are always a few who show great pity for the criminal and little compassion for the victim. When one recalls the German endeavor to exterminate the Jewish race and the millions of innocent men, women, and children—some almost infants in arms—who died in Nazi gas chambers and before Nazi firing squads, any action taken by the Allies to shorten the war, even by a few days, was justified. To bomb Germany was an act of mercy if it saved but a few lives of those whose only crime was that they were not born of pure German blood or if it rescued some of the countless thousands condemned to a living death in Belsen and other similar prison camps.

Ardua, Cape Riche, Western Australia

SOVIET WAR MEMOIRS: TRUTH, FICTION, AND POLITIC

DR. KENNETH R. WHITING

THE attitudes of Western scholars toward the role of history vary widely. Some dote on the Santayana aphorism that those who ignore history are doomed to repeat it. Others see Calliope as an attractive muse but a lying bitch for all her beauty. And still others see history as a "social science" based on painstaking research whose product is an approximately true picture of the past. Communists, however, from Karl Marx to the present generation, regard history as a true science. The accurate picture of the past enables Communist leaders to see present trends and thus predict the future course of events. But even a cursory reading of the "history" manufactured by Soviet writers over the last half-century indicates more "management" than scientific research. One example is the treatment accorded Trotsky as a historical personage. Trotsky was Lenin's field commander in the October Revolution, the creator of the Red Army, and a brilliant Bolshevik leader between 1917 and 1924; yet Trotsky's place in Soviet history since the early 1930s has varied from that of the Judas of the October Revolution to that of an "unperson," to use an Orwellian word. Trotsky's fate is only an extreme example of Soviet "managed" history.

Stalin's reputation at the hands of Soviet historians has been much more controversial. From his death in March 1953 to Khrushchev's "de-Stalinization" speech at the Twentieth Party Congress in 1956, Stalin was relegated to a sort of historical Limbo—neither good nor bad. Then the dam broke, and nothing too bad could be written about the evils of the "cult of the personality," which is a Soviet euphemism for the "evil rule of Stalin." Since the ouster of Khrushchev in October 1964, however, the pendulum has been gradually swinging the other way, and today Stalin's image is being refurbished. As a matter of fact, the official attitude toward Stalin's image

has become a fairly reliable indicator of how much or how little relaxation is being allowed in Soviet society at any given time. When Stalin was being denigrated in the late fifties and early sixties, the usual repressive atmosphere seemed to be lightening a little. With the growing adulation of Stalin since 1964, the thawing cultural and intellectual atmosphere began to freeze again, and it has frozen solid since the invasion of Czechoslovakia in August 1968.

One of the best indicators of Stalin's image in the Soviet version of the past has been the role allotted to him in World War II, the "Great Fatherland War" in Soviet parlance. Between 1945 and 1953 he was the supreme genius in things military, the architect of the Soviet victory over the Nazis, the greatest military strategist in all of history. From 1956 until late 1964, his reputation declined until it seemed that the war was won in spite of Stalin. And from 1965 until the present, his reputation has been gradually rehabilitated, although not to the point it reached in the 1945-54 period. The rehabilitation process is being carried out through the memoirs of the marshals and generals who led the Red Army during World War II, a veritable flood of memoir literature. One reason is that hardly any were published during the lifetime of Stalin. The memoirs are either in the form of books or shorter versions published in the *Voенно-Исторический Журнал* (The Military-Historical Journal), a publication devoted largely to World War II put out by *Red Star*, the official Soviet armed forces newspaper.

Fortunately for those who cannot read the Russian language, Seweryn Bialer has translated and edited a comprehensive selection of this memoir literature about the Great Fatherland War, especially that concerning Stalin's alleged wartime role.† The book is divided into five chapters, dealing respec-

†Seweryn Bialer, *Stalin and His Generals: Soviet Military Memoirs of World War II* (New York: Pegasus, 1969, \$10.00), 644 pp.

tively with the prelude to the war, the disasters of 1941, the battle of Moscow, the relationship between the high command and the field commanders, and the battle for Berlin. Obviously, this is a highly selective treatment of the war. For example, there is almost no coverage of the war from the counteroffensive around Moscow in the winter of 1941-42 to the battle for Berlin in 1945. Thus the crucial battles of Stalingrad, Kursk, Leningrad, etc., get somewhat cursory treatment. The book is intended, however, not as a comprehensive narrative history of the Great Fatherland War but as a selection of materials to illustrate the Soviet version of Stalin's role in the war. The selection of memoirs is wide enough, though, to enable the perceptive reader to get some idea of Stalin's actual role as a war leader, evaluate the myths that have arisen since the war, and gain some insight into the political reasons for the almost myth-like treatment of Stalin's role by Soviet historians between 1945 and the present.

Professor Bialer, in a 30-page Introduction and in his introductory material preceding each section of the book, does an excellent job of putting the memoir literature in perspective. His copious notes (unfortunately in the back of the book) are more than adequate, fully explaining both the esoteric Soviet terminology and the identities of the myriad characters referred to. In short, this is a first-rate piece of scholarship.

The authors of the memoirs selected by Bialer are impressive indeed, including such outstanding military leaders as Zhukov, Biryusov, Voronov, Kazakov, Kuznetsov, Bagramian, Konev, Rokossovskiy, Shtemenko, and Chuikov—a veritable *Who's Who* of the Great Fatherland War. Some of them are more interesting than others, both in content and style. Actually, style is the worst part of most Soviet military memoirs—but this is not a failing restricted to military men on the other side of the Iron Curtain.

In an earlier book on the Soviet version of World War II by Matthew P. Gallagher, the subtitle *Myths, Memories, and Realities* pointed up the fact that a true picture of the Soviet role in that war cannot be gleaned from the Soviet official histories or memoirs of the participants.¹ On the other hand, there has been a tendency in the West to rely too heavily upon the German version of the conflict, largely because of the easier availability of German accounts of what happened. The six-volume official Soviet history, *Istoriya Velikoy Otechestvennoy Voyny Sovetskogo Soyuza, 1941-1945* (History of the Great Fatherland War of the Soviet Union, 1941-1945), published between 1960 and 1965, plus this recent flood of memoirs, should, if used carefully in combination with the German materials, enable Western historians to construct a more accurate picture of the Soviet role in World War II. John Erickson, author of the definitive work on the Red Army between 1917 and 1941,² should be supplying this much-needed opus in the relatively near future.

Although official histories and memoirs help, nothing can replace access to the Soviet archives, which are still closed to Western scholars. Fortunately, jealousies among Soviet military leaders, e.g., the Zhukov-Konev feud, help make their memoirs more revealing; and the tailoring of the official histories to fit the prevailing political line at any one time does at least produce some variations in interpretation. It is true that several untruths do not necessarily add up to *the* truth, but at least they make more interesting reading than did the monochromatic output during the Stalinist postwar decade. Professor Bialer's book gives the reader a chance to sample some of the color pervading contemporary Soviet war memoirs, to get closer to the thinking of the men who led the Soviet armies in World War II. It is a book that can be highly recommended.

Aerospace Studies Institute

Notes

1. Matthew P. Gallagher, *The Soviet History of World War II: Myths, Memories, and Realities* (New York: Praeger, 1963).

2. John Erickson, *The Soviet High Command: A Military-Political History, 1918-1941* (New York: St. Martin's Press, 1962).

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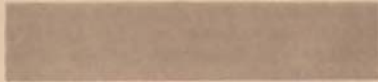


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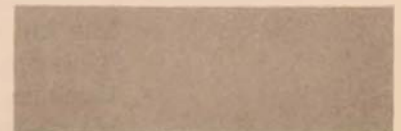


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AWARD

The Air University Review Awards Committee has selected "Concepts, Objectives, and Doctrine" by Captain Henry Viccellio, Jr., USAF, as the outstanding article in the March-April 1970 issue of the *Air University Review*.

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