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FACULTY OPINION

THE NEW AND IMPROVED "NEW ECONOMICS"

by Leslie Darbyshire, Professor
Dept. of Operations Research and
Administrative Sciences

In the midst of the continuing debate between the monetarists and the fiscal "engineers" as to the most appropriate method of controlling the economy, some fundamental changes are occurring in American governmental affairs.. Economists now find themselves in the role of defrocked witch-doctors as a result of their continuing inability to foresee the outcomes of the various poultices applied to the U.S. patient during the last five years. The combination of recession and inflation we continue to experience is as well described by a Phillips screwdriver as a Phillips curve.

We were made to realize last fall that there were limits to the willingness of our trading partners to continually hoard dollars in financing our overseas excesses. We have not yet discovered that there is a domestic equivalent of this balance of payments readjustment. Quite apart from whatever benefits accrue from the spendings of the purposive deficits of our full-employment budget there is a non-trivial problem of placing an extra $40 billion of Federal debt in a non-inflationary mode, particularly since it has to be superimposed on a mountain of increasingly short-term debt already in existence. Rolling this debt over, as each certificate reaches its maturity date, is already causing severe headaches for all major users of American capital markets.

The other side of the coin poses extraordinary problems in "efficient" spending. How does any institution go about deciding to spend an extra $40 billion in aid to achieve reasonably ordered objectives? How do you control such incremental spendings, through what existing institutions; what additional agencies do you create, how do you assemble the necessary talents in such a short period of time? What are the prospects of dismantling whatever part of the spending apparatus proves later to be somewhat less than useful? Perhaps even more fundamental, what kinds of lasting benefits are supposed to accrue?

The prospects of spending a vastly increased amount of money are almost certainly extremely attractive to a decision maker who has the nasty assignment of having to choose between alternatives. If the budget restraint is pushed farther and farther out, such nasty choices don't have to be made; everybody can apparently be satisfied.

Suppose now that the diagnosis of the economy's malaise is incorrect and that our "alledged" 6 per cent unemployment is more structural than a function of inadequate aggregate demand? What kinds of spendings will lead to full employment for aerospace engineers, unskilled minority groups, elementary schoolteachers, physicists, etc.? Why do people continue to save dollars that are plentiful, cheap and losing value each day? Where is the model that satisfactorily explains rising wage rates in backward industries such as railroads, rising prices in industries saddled with excess outdated capacity such as steel? How can the populace continue to thwart the best efforts of our leaders especially when they are the recipients of such magnificent expert advice?

DEVELOPMENT AND PROCUREMENT OF THE M-16 RIFLE

by T. L. Gatchel

The development and procurement of the M-16 rifle received much criticism from numerous sources. The author believes that some of the criticism was warranted, but some was not, and points out why many of the so-called bad decisions were not so obvious at the time.

T. L. GATCHEL, Major, USMC, received his M.S. Degree in Management in December 1971.

Case study submitted to Professor Darbyshire for Management Policy, MN 4105.

In order to fully understand the decisions behind the development and procurement of the M-16 rifle, one must look back to WWII. In 1942 the Germans developed a weapon that was to have lasting, long-range effects on the development of military small arms. Designated an assault rifle (sturmgewehr), the new weapon was radically different from standard military rifles in several ways. First, it fired a new intermediate cartridge that was shorter and less powerful than a standard rifle cartridge. Second, the new rifle was capable of selective fire. In other words, it could be fired either semiautomatically like a rifle or fully automatically like a submachine gun. Third it was shorter and more compact than a standard rifle, and, finally, its production relied heavily on the use of stampings and non-strategic materials for low cost and ease of manufacture.

Following WWII, many European governments followed the German lead and developed assault rifles and intermediate cartridges. Notable examples were the Soviet AK-47, the British EM-2, and the Belgian FAL. /1 The U.S. Army, however, devoted its efforts to developing a standard rifle with selective fire capability that would fire a shortened, but still full power, cartridge. The latter was made possible by the development of more powerful gunpowders.

/1 In 1951 Britain adopted the EM-2 and a .280 caliber intermediate cartridge. Later that year Winston Churchill returned to office as prime minister and personally reversed the decisions in hopes of standardizing equipment with the U.S.

This difference in concept between the Europeans and Americans presented a severe problem for NATO, which was attempting to standardize ammunition for all member nations. The U.S. strongly desired that the American cartridge be adopted and, after applying pressure on its allies, prevailed. In August of 1954 NATO adopted the American cartridge, which was then designated the 7.62 mm NATO. Canada, Great Britain, and Belgium all adopted the FAL for use with the new cartridge, but the U.S. did not have a rifle to fire its own ammunition. A brief look at how such a rifle was eventually developed provides an interesting comparison with the later M-16 program.

As early as 1952 the Army began testing several rifles including the FAL, the EM-2, and what was to become the M-14./2 By 1955 the field had been reduced to the M-14 and the FAL, and the Army had gone so far as to have some of the latter manufactured by two American small arms firms to determine the problems of converting the metric working drawings into U.S. measurements. Both weapons were considered satisfactory, and tests continued into late 1956 when another weapon, the AR-10, entered the field. Developed by Armalite, Inc., the AR-10 was a relatively advanced assault rifle that made considerable use of plastics, metal stampings, and other advanced fabrication techniques. In spite of its advantages, the AR-10 entered the testing too late to be a serious competitor, and in May of 1957 the U.S. Army adopted the M-14. In keeping with the long standing policy of maintaining multiple sources for major weapons, the Army awarded M-14 production contracts to three civilian firms in addition to producing them at Springfield Armory.

In addition to standardizing U.S. Ammunition with NATO, the M-14 was supposed to have provided another major benefit. It was to have replaced not only the M-1 rifle, but also the Browning Automatic Rifle, the carbine and the submachine gun. This, in turn, would have meant a single cartridge for all infantry type weapons except the pistol./3 The M-14 proved to be a good rifle, but was inadequate in several other respects. It was too large to be a good replacement for the submachine gun and was only marginally controllable when employed as an automatic rifle (fully automatic fire).

As is the case with most weapons systems, the adoption of a new rifle does not halt the search for an even newer one. Accordingly, the Army became interested in developing a new weapon to fire a high velocity, .22 caliber intermediate round. The idea of a small caliber, high velocity round was not new, but the state of propellant and weapons manufacture had caused earlier attempts to be generally unsatisfactory for military purposes. In 1957 the Army announced specifications, and Winchester and Armalite both developed rifles and cartridges to meet them. The Armalite rifle was essentially a scaled down A R-10 firing a modified version of an existing Remington commercial cartridge. The new rifle was designated the AR-15. The two weapons were tested during 1958 and 1959, and in 1959 the Army placed an order for 1,000 AR-15's. Armalite had spent $1,450,000 in developing the AR-15 to this point, and, in spite of the potential, felt that it could not continue. Colt's Patent Firearms Manufacturing Company of Hartford, Connecticut, stepped in and purchased the design, manufacturing, and marketing rights for the new rifle.

For perspective it should be noticed that the first M-14s were not delivered to the Army until October of 1959. In March of the following year General Trudeau testified before a Congressional hearing that the M-14 would be obsolescent by 1965, and that the Army was looking for a replacement./4 At this time the potential replacements were not limited to conventional firearms. Possibilities included such concepts as

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/2 Designated the M-14 upon adoption, it was called the T-44 during testing.

/3 The M-6- machinegun, which fires the NATO cartridge, was also adopted at this time.

/4 John Lachuk, "The M-14 Rifle . . . Hail and Fairwell." Gun Digest, 1965, p. 54.

small caliber rocket launchers and a Special Purpose Individual Weapon (SPIW) designed to fire dart-like flechettes at point targets and some type of explosive charge at area targets.

The AR-15 was given a big boost toward becoming that replacement when General Curtis Le May became personally interested in it as a possible replacement for the M-1 carbines used by the Air Force's security troops. A test was conducted at Lackland Air Force Base in which the AR-15 was compared with both the M-14 and the Soviet AK-47. The AR-15 performed well and was considered to best meet the requirements of the Air Force, so in September of 1962 the Air Force awarded Colt a contract for 8,500 AR-15 rifles. By this time the AR-15 had been given the military designation M-16. Some of these Air Force M-16s were turned over to the Army's Special Forces for combat testing in Vietnam. In retrospect it can be seen that this contract was the first step in a major procurement program that seemed to grow without adequate planning. It seems reasonable that decisions should have been made concerning several important questions:

1) Should the Army have attempted to jump past another conventional rifle to develop an unconventional type individual weapon such as the SPIW to replace the M-14?

2) If not should the Army have adopted the M-16 or continued to experiment further?

3) Should the Air Force have been allowed to adopt the M-16 if the Army didn't?

In discussing the above questions the following facts are important:

1) The Army and Marine Corps were not completely satisfied with the M-14, but neither were completely convinced of the effectiveness of the 5.56 mm (.22 caliber) cartridge./5

2) The Air Force was not involved with the M-14 and definitely wanted the M-16.

3) Generally speaking, U.S. small arms have been developed by the Army and have then been adopted by all services for reasons of standardization.

4) Developmental contracts were let to Springfield Armory and 3 civilian firms to develop prototype SPIW to be tested in February of 1963. The tests showed that the SPIW was a long way from being a practical weapon.

5) Almost without exception, U.S. standard rifles had been developed and first manufactured at Springfield Armory with later production by other U.S. arsenals and civilian firms. Other types of small arms, however, have generally been developed by civilian manufacturers.

6) U.S. forces in Vietnam numbered approximately 14,000 advisors and special forces personnel. Predictions by the Secretary of Defense and chairman of the joint chiefs of staff were that all U.S. troops would be out of Vietnam by 1965.

/5 The Army had adopted metric caliber designations in accordance with NATO practice.

7) Army plans for FY 1964 included the purchase of 85,000 M-16s to equip their airborne divisions and one test air assault division.

In fact, no definite plans were made, and procurement of the M-16 continued in a haphazard manner. Table 1 shows the chronology of M-16 contracts to date.

Technical Problems

A good deal of the controversy surrounding the M-16 was directly related to technical problems. Similar problems have occurred in the development of almost all military small arms, but in the past the problems have not been so widely publicized.

The first of these problems involved the rate of twist of the rifling. The original M-16s were manufactured and tested with barrels with a rate of twist of one turn in 14 inches. Later accuracy tests, however, showed that the standard 55 grain bullet became unstable when fired through these barrels during cold weather, and, that even at ordinary temperatures, the dispersion was twice that of bullets fired under the same conditions from barrels with a rate of twist of one turn in 12 inches. If accuracy were the sole criterion, the answer would be obvious. In the case of the 5.56 mm round, it isn't. The 5.56 mm bullet makes up for its small size partly by its extremely high velocity and partly by being only marginally stable in flight. When the bullet meets resistance, this balance is upset, and the bullet begins to tumble. The tumbling effect gives the bullet a lethality out of proportion to its size. The tradeoffs involved here were summed up by Dr. Wilbur B. Payne, Chief of Operations Research, Undersecretary of the Army, as follows:

> The experiments available would indicate the less stable the bullet, the more lethal when it hits the target, correspondingly, the less accurate it is, the lower the probability of hitting the target./6

The conflict was resolved in favor of increased accuracy, the 12 inch twist barrel was adopted, and earlier rifles were converted. The problem did not end there because, even with the new barrels, the 55 grain bullet did not possess the range capability required for effective machine gun fire. A heavier, long-range bullet was developed but was unsatisfactory since it would have required still another barrel change. This, in effect, left two alternatives: continue to attempt to develop a satisfactory machine gun for the 5.56 mm round or drop such attempts and continue to use the 7.62 mm NATO round for the machine guns.

One attempt to follow the first course of action resulted in the Stoner 63. Designed by the designer of the M-16 and produced by Cadillac Gage Co., the Stoner 63 was a family of weapons that could be assembled from a series of interchangeable components./7 By using different combinations of parts, various types of rifles, carbines, submachine guns, and machine guns could be assembled, all firing the 5.56 mm round. The Marine Corps tested the Stoner system and was favorably impressed, but it was not considered feasible for the Marine Corps to adopt a rifle that was not in the Army supply system.

This left alternative two, one round for the rifle and a different one for the machine gun. Theoretically this is poor but in practice is not as bad as it seems. The M-14 rifle and M-60 machine gun both use the 7.62 mm NATO round, for example.

/6 E. H. Harrison, "What's Ahead for the M-16? An Expert Takes a Look." American Rifleman, January 1968, p. 31.

/7 Eugene Stoner was chief engineer at Armalite, Inc., where he designed the AR-10, AR-15 (M-16) and AR-18, among others, before leaving to work on the Stoner 63.

Although the individual rounds are identical, rifle ammunition is packaged in bandoleers containing five round clips while machine gun ammunition comes linked into 250 round belts. Since it is not practicable to link rifle ammunition into machine gun belts in the field and vice versa, two types of ammunition exist in practice. The real problem was that the Army had stressed the advantages of having a single round for both weapons when pressing for the adoption of the 7.62 mm round by NATO.

The most serious of the technical problems centered around the propellant or powder used in the 5.56 mm cartridges. The round had been developed commercially by Remington Arms Co., and that company produced the initial lots of military ammunition. /8 The powder used was Du Pont IMR 4475, an extruded nitrocellulose powder originally developed for the 7.62 mm NATO round. As long as the production lots remained small, everything was fine. In January 1964, however, Du Pont notified the Army that IMR 4475 could not be produced in large lots and still meet the Army's pressure specifications. The only way of consistently meeting the pressure standards would have been to reduce the velocity of the bullet. Since the bullet's lethality had already been reduced by changing the twist of the rifling, the Army felt that it could not afford to reduce it further by lowering the velocity.

Accordingly, the Army asked Du Pont, Hercules, Inc., and Olin Mathison Chemical Co. to submit powder samples that could meet the requirements. The Hercules sample was unsatisfactory. Du Pont's CR 8136, a powder similar to IMR 4475, was accepted and adopted by Remington. Olin submitted WC 846, a ball powder, which was accepted and chosen by Olin's ammunition division, Winchester-Western and also by the Federal Cartridge Co. Named for the shape of the individual grains, ball powder was developed after WWI to make use of surplus artillery propellant and has been successfully used in all U.S. rifle and machine gun ammunition since that time. It had been used interchangeably with IMR type powder in billions of rounds with no hint of the troubles to come.

In March of 1964 it became obvious that when ammunition loaded with the WC 846 ball powder was fired in the M-16, an unacceptably high number of malfunctions occurred. Colt notified the Army that if ball powder ammunition was used for the acceptance tests, more than half the rifles would fail to meet the requirements. In spite of the fact that a large portion of service ammunition was of the ball powder type, the Army allowed Colt to use only IMR type ammunition for the acceptance tests. A special House of Representatives investigating committee describing this decision said that it "borders on criminal negligence."/9 It would be difficult to disagree.

In December 1964 the problem was compounded when Remington notified the Army that Du Pont CR 8136 was also beginning to show excessive pressure dispersion. As a result, Remington switched to Olin's WC 846. This meant that the Army was back to a "sole supplier" situation, and that all producers were using the problem-causing ball powder. The Army again called for new samples, and the only satisfactory one submitted was Du Pont's IMR 8208M. All three commercial suppliers preferred to continue loading the ball powder, so the Army directed that the new powder be loaded at two of its government-owned, contractor-operated ammunition plants. This move solved the single source of supply problem but not the more serious one of the unexplained malfunctions.

Looking back several years later, an Army spokesman expressed the following opinion:

/8 Remington Arms Co. is owned largely by Du Pont.

/9 E. H. Harrison,"What's Ahead for the M-16? . . . " op. cit. p. 24.

> Had the Army anticipated these developments, it is most unlikely that the course chosen in January 1964 would have been the same. A decision to reduce the velocity requirement, and continue loading IMR 4475 propellant would probably have been made instead, and the development of alternate propellants could have been pursued more deliberately./10

Combat Problems and Resulting Modification

After studying the problem thoroughly, Eugene Stoner, Colt's experts, and the Army's Small Arms Weapons Study Group all reached the conclusion that the use of WC 846 ball powder was causing two bad effects. It significantly increased the rate of fire of the M-16, which was known to cause malfunctions, and it produced more fouling than IMR type powders, which was thought to cause malfunctions.

The first of these effects was overcome by redesigning the buffer of the M-16 to bring the rate of fire back down to the level for which the weapon had been designed. Technically this was relatively simple, but a lack of urgency on the part of the Army and Colt resulted in a year passing before the new buffers were available in the field. The redesigned buffer solved certain problems but not the serious failure to extract a fired cartridge, that could leave a soldier in combat with a useless weapon until he could clear the bore with a cleaning rod.

In 1966 this problem changed from a more-or-less theoretical one to a practical one as an increasing number of incidents of this nature began to occur in Vietnam. Colt immediately sent two four-man troubleshooting teams to Vietnam to investigate the problem. Their opinion was that the troubles were caused largely by poor maintenance on the part of the individual soldier resulting from a lack of effort, poor training, and a lack of cleaning gear. The lack of cleaning gear was an inexcusable logistics foul-up, but the other two factors warrant further explanation. Unlike most small arms, that have been adopted and "shaken down" during peace-time, the M-16 was, in many cases, initially issued to units that were already in combat in Vietnam. The resulting inadequate time for thorough training was compounded by the fact that the M-16 had been ballyhooed by its supporters as a weapon that required almost no care. Training manuals, for example, contained such statements as:

> This weapon requires the least maintenance of any type weapon within the Army arsenal today.
>
> This weapon will fire longer without cleaning or oiling than any other known rifle.
>
> An occasional cleaning will keep the weapon functioning indefinitely./11

Manuals were changed to reflect the need for careful weapons maintenance, and training was increased, so the maintenance situation was much improved when the Colt teams returned to Vietnam in early 1967. Unfortunately, the extraction malfunctions had not improved. Mr. Stoner and Colt's experts felt certain that problems were being caused by the added fouling from the WC 846 powder. The Army Material Command disagreed stating that an extensive testing program had failed to show any connection between the fouling and the malfunctions. In fact, they had been unable to produce a high rate of malfunctions during testing in spite of efforts to duplicate every possible condition encountered by the troops in Vietnam

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/10 Ibid. p. 29.

/11 Ibid. p. 26.

In the meantime, several other attempts were made to solve the problem. A chrome plated chamber was developed, which seemed to have some effect on reducing the failure to extract malfunctions. Poor lubrication was also thought to be a possible cause of the problem, so a replacement was sought for the rifle grease that had been used with the M-1 and M-14. After trying a number of lubricants, the Army settled on one that had been developed in 1959 for the Air Force's 20 mm "Vulcan" cannon. The delay in finding a satisfactory lubricant was another of the many aspects of the M-16 program that was criticized by the House investigating committee, but there appears to have been no reason to have supposed that the lubricant that was finally chosen would have worked any better than the ones that had been tried and rejected. It was largely a trial and error procedure with a large number of possibilities.

Along the line there had also been a controversial major modification to the M-16. The design of the M-16 is such that the bolt cannot be closed by hand. The bolt can be opened by hand but is closed by spring pressure. If some obstruction is present that cannot be overcome by the spring, the rifle must be disassembled and the obstruction cleared before the bolt will go home. The Army felt that this characteristic was unsuitable for a combat weapon and requested a modification that would allow the bolt to be closed by hand. The requested change was made, and the resulting rifle was designated the M-16A1./12 The resulting cost increase of $3.50 per rifle was yet another target for criticism by the House investigating committee. The Air Force wanted no part of the modification and continued to procure M-16's. The Marine Corps expressed fear that, when the bolt would not close by itself, forcing it closed might only aggravate the problem. Nevertheless, the Marines eventually adopted the M-16A1 in spite of these reservations. In January of 1967, the Marine Corps announced that it would use the new rifle to equip Marines in Vietnam, who at that time were using the M-14. The major factor behind this decision was standardization with the Army.

No one approach seems to have solved the technical problems that plagued the M-16, but the combination of them apparently did. The malfunctions ceased to be a problem, and the M-16 was generally well accepted by the troops. In many respects its light weight and selective fire capability made it ideal for the particular needs of combat in Vietnam.

Procurement Problems

Not all of the Army's problems with the M-16 were of a technical nature. A list of items criticized by the House investigating committee would also contain the management of the procurement program. A particularly sore point with the committee was the failure of the Army to aggressively negotiate with Colt for the manufacturing rights of the M-16.

Most of the U.S. military small arms have been developed by commercial firms with the government later purchasing the manufacturing rights and establishing multiple production facilities either at government arsenals or other civilian plants. The purpose behind this policy is sound: to ensure uninterrupted production in the event of sabotage or labor troubles. In September 1963, the Army accordingly requested from Colt a quotation on the design, manufacturing, and marketing rights for the M-16. Colt refused stating that no such request would be considered until requirements for the rifle exceeded 500,000 units. Since the Army did not anticipate the need for that many weapons, no pressure was applied, and the matter was pursued on an informal, oral basis only.

/12 For simplicity, the term M-16 will be used in this paper for both weapons except when the distinction is important.

In October 1964, Colt took the initiative and made an offer in spite of the fact that the 500,000 rifle limit had not been reached. Colt's most favorable offer was for $5,400,000 cash plus a 5% royalty on all rifles manufactured by other sources. A $10 credit per rifle was added, however, that would have eliminated any cash payment if outside production exceeded 540,000 rifles. This time it was the Army that rejected the offer, again stating that it did not anticipate the need for that many M-16s.

In January and May of 1966, two contracts were let for 100,000 rifles each, which put Colt's orders well over the 500,000 mark. The Army still did not press for manufacturing rights, this time giving the urgency of the Vietnam situation as the reason. In June, 1966, as a condition to a contract that would place Colt's orders over the 600,000 mark, Colt and the Army finally agreed to negotiate. In December of that year the Army announced the decision to replace all .30 caliber weapons in the system with M-16's. The Assistant Secretary of the Army for Installations and Logistics indicated the magnitude of this decision by stating that the action would put the M-16 procurement program "in the hundreds of millions of dollars."/13

On 30 June 1967, an agreement was signed. For the M-16 manufacturing rights Colt received the following:

1) $4,500,000 cash.

2) 5-1/2% royalty on all weapons and spare parts manufactured by other sources.

3) Commitment by the Army to purchase an additional 632,500 rifles from Colt for a total of 1,400,000 M-16's from Colt alone.

The need for such an agreement was dramatically pointed out the following day when UAW local 376 struck at Colt. M-16 production was halted for a week until the strike was settled.

In October of 1967 the House of Representative Investigating Committee released its findings, many of which have already been noted. Another area criticized the amount of Colt's profits from the M-16. All contracts had been negotiated on a cost plus 10% basis, but, according to the committee, Colt's profits had been 19.6% in 1965, 16.8% in 1966, and 13.4% for the first four months of 1967. The committee also questioned Colt's accounting system, the adequacy of their proposed costs, and compliance with certain public laws. Colt agreed that their earnings and sales both reached record levels during the second quarter of 1967 but denied that any excess profits were involved. Colt argued that they had expended $5,684,000 on development costs for the M-16, which was only a potential major military weapon when the design was purchased from Armalite. GAO was asked to study the matter further.

Armed with the newly purchased manufacturing rights, the Army solicitied bids from 13 potential manufacturers for the production of two lots of 240,000 M-16's over a two-year period beginning in August of 1969. Four companies responded: Hydramatic division of General Motors with a bid for $56 million, Harrington & Richardson Co. (H&R) with a bid of $42 million, Maremont Corporation with a bid of $36 million, and Cadillac Gage division of Ex-Cell-O Corp. with a bid that apparently made them a competitor. At this point the Army decided that the timetable was too slow and that the contracts should be awarded on the basis of ability to begin production by February, 1969, rather than on cost. GM and H&R were awarded the two contracts. The price differential between the two companies was based on wage scale differences between Detroit and Worcester, Mass., and on the fact that H&R could retool their existing M-14 production line while GM had to start from scratch.

/13 E. H. Harrison, "Is the M-16 Really Here to Stay?" American Rifleman, February, 1968, p. 45.

Senator McGovern criticized the decision to reject the lower Maremont Corp. bid, and Representative Ichord reconvened the special M-16 investigating committee to look into the matter. In several respects, however, the Army's decision appears to have been justified. Costs were lower than anticipated, and in December of 1968 the contracts were "definitized" to $40.9 million for GM and $33.9 million for H&R. Both companies began production ahead of schedule. This and accelerated production by Colt allowed a seven month jump on rearming the South Vietnamese Army and Popular Forces with the M-16.

Continuing Problems

The M-16 seems to be destined to produce controversy. In September of 1969 the Army acknowledged that the M-16 would become the standard rifle for all Army combat troops, with the M-14 issued to nondeployable administrative personnel and ROTC students. Thus ended a cycle that began with the M-16 as a limited issue weapon for special units and ended with roughly three million rifles produced. The Army's decision also ended the NATO standardization that had begun a decade before under pressure from the U.S. The Wall Street Journal speculated that the Europeans would not follow the U.S. lead this time./14 Doing a little speculating themselves, however, three major European small arms producers have developed prototype 5.56 mm assault rifles from their standard 7.62 mm NATO models./15 Other nations have also expressed an interest in the M-16. In September of 1970 the South Korean government negotiated a contract with Colt for the right to produce M-16's in Korea.

The M-16 has not escaped the notice of various protest groups either. An article in the Wall Street Journal of 7 May 1971 contained the following item:

> A Stanford University student with a portfolio of x-rays showing skulls shattered by M-16 rifle bullets turned an otherwise uneventful Colt Industries, Inc. annual meeting into a debate over the company's role in supplying guns for the Vietnam war.

In November of 1971 the Connecticut Citizen Action Group, a consumer group organized by Ralph Nader, charged that Colt was guilty of concealing defects in the M-16's that it produced. The group's 21 page legal style brief, titled "The M-16, Colt's Lethal Lemon," stated that its purpose was to: " . . . focus attention on a most cruel and violent form of corporate subversion of the public and national interest."/16 All that remains is for the Sierra Club to announce that the M-16 is somehow polluting the environment.

/14 "M-16 Rifles to Replace Heavier Models for All Army Combat Troops." Wall Street Journal, 15 October 1969, p. 16.

/15 The firms are SIG of Switzerland, Fabrique National of Belgium and Heckler & Koch of West Germany.

/16 "Fresh Controversy Hits the M-16". American Rifleman, December 1971, p. 50.

TABLE 1

The following chronology was compiled from notices made at the time the contracts were awarded. Some contracts may possibly have been overlooked, but the purpose of showing the general trend of M-16 procurement has been accomplished. All contracts listed are by Colt unless otherwise indicated. The Wall Street Journal (WSJ) usually reports contracts in terms of dollars, and the American Rifleman (AR) in terms of numbers of rifles. Information from the two sources was occasionally conflicting. Whenever possible, these conflict were resolved by the use of other, more recent information.

Date	#Rifles	$ Value	Source
March 1958	10 (Armalite)		Musgrave and Nelson
1959	1,000 (Armalite)		Johnson and Lockhaven
Sept. 1962	8,500		(AR) April 66, p. 57
April 1963	19,000	$2,014,000	(AR) April 66, p. 57 (WSJ) 8 May 63, p. 2
Nov. 1963	104,000	$13,296,923	(AR) April 66, p. 57 (WSJ) 8 May 63, p. 7
June 1964	20		(AR) April 66, p. 57
Nov. 1964	33,822	$4,305,750	(AR) April 66, p. 57 (WSJ) 3 Nov 64, p. 5
Jan. 1965	500		(AR) April 66, p. 57
Feb. 1965	50		" " " " "
July 1965	1,000		" " " " "
Aug. 1965	37,342	$4,182,304	" " " " " (WSJ) 26 Aug 65, p. 6
Sept. 1965	18,671	$2,072,481	(AR) April 66, p. 57 (WSJ) 21 Sept 65, p. 13
Oct. 1965	5,369		" " " " " " " (AR) April 66, p. 57
Nov. 1965	25		" " " " "
Jan. 1966	100,000	$5,750,000	" " " " " (WSJ) 10 Dec 65, p. 22
May 1966	100,000	$5,750,000	(WSJ) 23 May 66, p. 10
June 1966	203,905	$29,035,408	(WSJ) 20 June 66, p. 6 (AR) August 66, p. 69
June 1966	17,372		(AR) March 67
Oct. 1966	75,000	$9,431,000	(WSJ) 13 Oct 66, p. 4 (AR) Feb 68, pp. 44-49
Sept. 1967		$25,871,701	(WSJ) 5 Sept 67, p. 11
April 1968	245,000 (H&R) 245,000 (GM)	$42,000,000 $56,000,000	(AR) June 68, p. 60

Date	#Rifles	$ Value	Source
June 1968		$15,780,937	(WSJ) 18 June 68, p. 15
Oct. 1968		$23,400,000	(WSJ) 7 Oct 68, p. 23
1 Nov 1968		$13,300,000 (H&R) $18,700,000 (GM)	(WSJ) 1 Nov 68, p. 23
Nov. 1968		$30,300,000	(WSJ) 18 Nov 68, p. 15
July 1969	458,435 229,217 (GM)	$41,200,000 $23,700,000	(WSJ) 22 July 69, p. 2
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APPLICATION OF THE PLURAL EXECUTIVE CONCEPT TO NAVAL MANAGEMENT

by J. J. Murphy

Advocating organizational innovation, the author raises some interesting thoughts pertaining to the benefits of group management (plural executive concept) as compared to individual management and its application in the Navy.

J. J. MURPHY, CDR, SC, USN; B.S. 1955, Pennsylvania University; Received M.S. Degree in Management in December 1971.

Term paper submitted to LCDR Lane for Resource Management for Defense, MN3171.

"A camel is a horse which was put together by a committee." Although this is a classic jest made by those who have been unsuccessful in the effective use of committees, a review of naval and other military organizations would make it appear that our past leaders have taken it to heart. The one man responsibility concept seems to be taken as a law of nature not to be tampered with. Though assignment of group responsibility and group actions is found within our organizational structure, it is quite sparse, and where it does occur, it is limited to the staff function. With the exception of the Joint Chiefs of Staff, which was so organized by Act of Congress in 1947, nowhere within the military structure is group responsibility assigned as a line function. The Joint Chiefs of Staff were so organized to reduce defense inefficiencies caused by inter-service rivalry and, within the complexities of modern warfare and demands for improved resources management, to provide a broader base for high level military decision making. The efficiencies resulting therefrom over the past 25 years should be sufficient to convince anyone, but the hard line traditionalist, that line management by a group, a plural executive, so to speak, may be worth taking a look at. Certainly the demands placed upon the individual manager by rapid technological advancements, sophisticated systems analysis techniques, and unending financial frugality require every ounce of resources the modern manager can muster. There is certainly enough evidence available today in reports of the Government Accounting Office (GAO) to indicate that we haven't as yet reached the apex of efficiency in management.

Excepting the past decade or two, the military commander/manager's role has been primarily one of on the scene decision maker. In a combat situation where human life and military victory may be in the balance, the areas of considerations and alternatives are rather narrow and, in many cases, time is of the essence. Under such circumstances, there is a mandate for action by the single executive. However, times are changing and today, rather than being a purely military strategist or tactician, the naval military manager is finding himself in assignments ashore which are of a completely different environment than his traditional one. Today our organizational structure incorporates high level executive functions around the systems management concept. A concept which requires a much broader base for decision making than that of the traditional military strategist or tactician. Within the new environment, we have spend untold hours and dollars searching for pure technological and financial efficiencies. We must now certainly keep pace with improved management efficiency. Is it not time we throw off the yoke of tradition in military management and innovate? Is not the effectiveness of the Joint Chiefs of Staff a strong case for attempting the plural executive approach to high level management?

Before making a rash judgment in this area, let's subject the application of line committees (one whose authority involves decision making affecting subordinates responsible to it) to some theoretical investigation. There is a considerable degree of controversy about the plural executive concept. Protagonists are well supported on the issue that an executive committee is but an escape into irresponsibility and should never be supported. Yet, many advocates of the plural executive concept quote from experience cases where committees holding executive responsibility have discharged their duties quite effectively and efficiently.

Some may view the committee as being too costly. Why pay three or more executive salaries rather than one? However, anyone taking a quick glance at the pay scales which we are paying civilian staff assistants for providing an area of expertise to our single executive will soon realize that in the long run, the plural executive may be considerably less costly.

Inherent in any group action is the danger of compromise at the level of the least common denominator. This could prove to be not as strong and positive a course of action as that undertaken by an individual who has only to consider the facts as he sees them and then reach a conclusion. But then wouldn't the probability of making an incorrect decision be higher with the individual executive?

Another aspersion toward the use of a plural executive concept is that it tends toward self-destruction. Behaviorists tell us it is a rare group of men who can participate in the exercise of authority on a team basis. Almost invariably one man emerges as the leader. But when an individual becomes dominant, the nature of the committee as a decision-making group of equals changes and there actually emerges an executive with a group of followers or advisors. When the plural executive ceases to operate as a group of equals and especially when it becomes a battleground for warring camps, the politics of the situation may lead to decisions or recommendations worse than the weak ones based on the least common denominator.

One of the chief disadvantages of group action is the concept that responsibility is split and that since no one can practically or logically feel accountable for the group, no individual feels personally responsible for its actions. Also, since there is a tendency for groups or committees to seek unanimous or near unanimous conclusions or decisions, minority members are therefore in a strong position.

The main weaknesses of the committee approach were summarized in 1936 by L. Urwicks writing in the British Management Review:

> "A committee differs from an individual in three important respects: Its corporate personality is intermittent; it dies each time that a session closes; it is not available between meetings to make the detailed adjustments which are constantly necessary in translating policy into action. Being itself an organization, it postulates activities of direction and leadership. But these activities are necessarily

exercised by a chairman whose authority is also intermittent and whose responsibility is not personal and specific as would be the case with an individual. Its decisions can only be communicated to those responsible for acting on them in an impersonal form and almost always in writing. Thus it cannot have the personal contact with subordinates enjoyed by the individual."

Thus far, we have only viewed the negative side of this challenging concept. Rather than attempting to counter the drawbacks to the concept, let's first examine what could prove to be significant benefits. We all remember the old adage "two heads are better than one." This simple truth forms the basis for one of the primary advantages of the plural executive. The plural executive can bring to bear on a problem a wider range of experience that the single executive, a greater variety of opinion, a more thorough probing of the facts and a more diverse training in specialized aspects. Few problems fall entirely into a single area of competence such as engineering, production, finance, etc. Most problems, on the contrary, are systematic and require more knowledge, experience, and judgment than any one individual possesses. Proponents of the single executive state that one can usually grasp ideas and reasoning quickly from a concise memorandum. However, is it not often the case that many high level decisions based on one page recommendations do not allow the single executive to judge the decision at all, let alone change it? (He doesn't even know whether all the important facts are presented to him.) Then there is the decision made on the basis of a highly stylized presentation which aims at getting a "yes" from the boss with a minimum of discussion--and that usually means a minimum of understanding on the part of the executive.

One of the advantages of the executive judgment of equals is the stimulation of ideas resulting from the oral interchange of ideas and the cross examination techniques of the committee approach. Use of a plural approach further insures a more balanced judgment and normally one which can withstand intensified testing from all areas of concern. The dynamics of modern operations place a heavy burden on managers to integrate plans and activities. The plural approach in coordinating planning and execution of programs within this type environment is most effective.

After much research, renowned management theorist Peter Drucker in his work The Practice of Management goes so far as to claim that the role of chief executive should not be held by one person. He speaks of the "fallacy of the one-man executive." His arguments rest on the view that in large modern organizations there are always too many and diverse activities in the job for any one man. He states his opinion quite categorically: "There is only one conclusion; the chief executive job in every business (except perhaps the very smallest) cannot properly be organized as the job for one man; it must be the job of several men acting together."

Now that we have scrutinized the pros and cons of the application of this concept from a theoretical standpoint, let us take a close look at some actual experiences. While much experience exists in organizations with committees and with plural executives, the benefits of group management, as compared to individual management, have not been widely studied. However, the results of one study conducted by the American Management Association through interviews with executives and analysis of company records showed that the plural executive succeeds fairly well in helping to coordinate the activities of managers. It has a high potential for aiding in defining objectives, selecting alternate ways of achieving them, and measuring the success attained. In terms of functions, the plural executive is thus especially useful in planning and in certain broader aspects of control. These generally encompass the areas with which high level management is concerned.

Many of the world's large corporations have come to recognize the long range inefficiencies resulting from broadening the load placed on the single manager as a result of

organization growth and diversification coupled with rapidly expanding technology and cost consciousness during the past quarter century. To compensate for this, several have turned to the use of line committee executive in recent years. But one of the frontrunners in the use of the "management by executive committee" concept was E. I. DuPont Nemours & Co. of Wilmington, Delaware. In an effort to provide more efficient management in spite of the demands of wider diversification and growth, DuPont seized the plural executive concept in 1921. The plural executive is composed of the president and nine vice-presidents of the firm and is responsible for determining the broad, basic policies in operating the company, selecting the men to carry out the operation, and maintaining a continuous review of the business to insure that the men selected are doing a good job. Each member of the committee has equal status with one vote, including the president who usually votes only to break a tie. Split decisions are uncommon. When questioned concerning the advantages of the committee-line system, DuPont executives stressed:

> The Strength and Security of Group Decisions: The group is less likely to go to extremes since the committee assures a balanced viewpoint in every issue. They feel that it may take longer to get action but it pays off handsomely in better decisions and the ability to follow through on long range policies.
>
> Objectivity in Decision Making: The system permits discussion and consideration of policy by men relieved of day-to-day decisions, and without subordinate vested interests. Nobody on the committee can be influenced by the effect of the decision on an operation for which he is responsible because the committee members are not responsible for operations.
>
> Continuity of Administration: The committee will normally change so gradually that management is always on an even keel. Whereas, when a specific single executive ceases to function, many times there are serious disruptions. The plural executive insures the organization of an averaging out of temperament and ability in top management.
>
> Development of Personnel: The committee approach accommodates a greater diversity of executive talent. There is a place for the man who sings solo and also for the man who sings best in a chorus. Where there is decentralization at the top, there is initiative down the line. Other advantages briefly mentioned included: increasing the stature of department heads, relieving part of the burden which usually falls upon the chief executive, encouraging the resolution of problems at lower management levels, and flexibility.

It is also interesting to note that the executives were at a loss for ready answers when asked to list the disadvantages of the systems and were unable to cite any serious disadvantages.

Although DuPont is singled out herein as an example of enthusiasm for the plural executive concept, it is by no means alone in its feeling. Standard Oil of New Jersey and Phillips Electric of Holland are but two additional users of this concept and have found it most effective. In addition, such giants as General Motors, U. S. Rubber and Sun Chemical utilize the executive committee at various levels within their organizations.

When one stops to reflect, it is really the rare successful organization which operates on a one-man concept. The majority of successful top managers are, in fact, a team where two or more individuals, though not officially equal, work together as a team of co-equals in directing the operation of an organization.

Whether the line committee has value then depends on the ability to maximize the advantages and minimize the disadvantages of group action. This could possibly

be accomplished best by building in two requirements to our plural executive structure. First, there should be no collective responsibility.(Each member should have assigned to him the areas in which he makes final decisions and for which he is responsible. Deliberation should be joint and decision single). The second requirement would be that there be no appeal from one member of the plural executive to another. Whatever any one of them decides is the decision of all of top management.

But what of our Navy today? Could we use some improvement in high level management efficiency? Now such concepts as systems analysis, concept formulation, contract definition, life cycle costing, multi-year buys, integrated logistic support, total package procurement, and others are making unbearable demands upon the chief executives of the organization. These are demands which cannot be adequately met by an individual. Are we ready to break the shackels of tradition with organizational innovation? Certainly the opportunity is there! Our systems commanders, inventory managers, and the like are in a position much akin to that which triggered the search for new management techniques in industry and which ultimately lead to a widening use of line-committee management. Could not the Navy benefit if the Air System Command's chief executive was a line committee composed of technical, financial, and other management experts? Could we have better electronics spare part support for the dollar if the senior executive of the Navy Electronics Supply Office were, for example, an electronics engineer, a production analyst, and a top caliber business man performing as a plural executive? Could we make money with this concept in some of our lower echelon positions?

The willingness to innovate has long been the taproot of success. As the environment becomes more and more complex, the manager who recognizes the limitations of the single executive management and therefore applies the plural executive concept may well provide the success story for high level military management.

The challenge is there and in many of our large organizations there is nowhere to go but up!

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BARUCH,

BARUCH

by H. M. Mohorich

The author relates how history has repeated itself four times in this century in the area of national mobilization for war. The complex task of national mobilization planning and control requires formulation and study in peacetime if the country is to be ready for future conflicts.

H. M. MOHORICH, LCDR, USN; B.A., 1959, University of Colorado; Candidate for M.S. in Communications Management.

Term paper submitted to Professor Kline for Resource Management for Defense, MN 3171.

Within the last fifty years the United States has found itself engulfed in two World Wars requiring the exertion of the full force of its military, indistrial and economic powers. And, twice within this same period it has found itself a protagonist in limited wars. This paper attempts to analyze the efforts of the Federal Government to mobilize and control the nation's resources for the prosecution of these conflicts. I submit at the outset that these efforts have been slow to take effect, include many false starts, and reflect little realistic planning. I further submit that this nation inexplicably persists in making the same errors before, during and after each of the hostilities.

In 1931, Bernard M. Baruch, financier, economist, advisor to Presidents and Chairman of the WWI War Industries Board, when testifying before the Congressional War Policies Commission said:

> "...we must plan in such a way that, if war comes, we shall meet the enemy with our maximum effectiveness, with the least possible injury and violence to our people, and in a manner which shall avoid inflation and waste. Our plans should eliminate war profiteering and they ought to provide that each man, thing and dollar shall bear it's just proportion of the burden... they should be said with full recognition that modern war is a death grapple between peoples and economic systems rather than a conflict of armies alone...

" ...from my experience I am convinced that it is quite possible to prepare, in peace, plans that will make the transition from Peace Industry to War Industry without serious disruption, to carry on the feverish industrial activity of war with the least possible harm to civilian morale...

When we entered the World War, the frantic demands and uncoordinated counterbidding of our future associates in war had already distorted our own price structure...In other words there was a robust inflation here before we ever entered the war. Furthermore, nearly twelve months elapsed after our declaration before we had evolved controls and organization capable of coordinating our own and our associates' procurement activities and of controlling price."/1

Mr. Baruch repeated these comments for more than 35 years following WWI. As Chairman of the War Industries Board (WIB) during WWI he was charged with the responsibility for accomplishing the first mobilization of the nation's resources. His conclusions stem from the situation he interited as Chairman and the many efforts of the WIB to correct and stabilize that situation.

Prior to the advent of the WIB several federal boards had been created to gather information and formulate mobilization plans. In 1916 the Naval Consulting Board was established to survey 18,000 industrial plants and to formulate a list describing and classifying important industrial establishments. Because the data requirements were unknown the effort proved fruitless. Also in 1916 the Kernan Board was established to investigate the feasibility of government owned munitions, arms, and war equipment plants. Later that same year a Council of National Defense was organized to coordinate industries and resources for the national welfare. All three boards were vague in concept and had little authority. In July 1917 the WIB was established and replaced the Munitions Standards Board and General Munitions Board, both of which had been organized a few months earlier. The WIB was to investigate war industry needs, coordinate means and methods of increasing production, study resources, fix prices, and establish a priority system. This was the first time a priority system had been considered. The WIB was haphazardly organized, weakly constituted and operated without adequate and accurate information. Then, in May 1918, President Wilson asked Mr. Baruch to assume Chairmanship and re-delineated the functions of the Board as follows (Appendix I also refers):

1. Creation of new facilities and determination of new sources of supply.

2. Conversion of existing facilities as necessary.

3. Conservation of resources.

4. Advice to government purchasing agencies regarding prices to be paid for defense products.

5. Determination of production and delivery priorities.

6. Purchases of war materials for our allies.

Several committees were set up to carry out these functions. The Clearance Committee was established to determine those materials in which shortages were believed to exist and then clear them for release to industry. Within days, the committee was overwhelmed and hopelessly back-

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/1 Bernard M. Baruch, American Industry in the War, ed. R. H. Hippelheuser (New York, 1941), pp. 377-381.

logged, and a separate Priorities Committee was established to handle distribution of those items for which a shortage actually existed. In spite of the now apparently correct administrative machinery, the smooth flow of control was still hampered because information regarding the requirements for types of materials needed to produce final products was not known. Mr. Baruch described the problem as follows:

> "All of these factors contributed to the difficulty of laying down a program of requirements. The separate units of the Army could not compute their requirements until they knew the size of the particular part of the Army for which it was their legal duty to provide. The size of the Army to be here and abroad at any given time could not be easily computed without definite knowledge of the amount of shipping that would be available both for men and supplies. Frequently the kind of equipment could not be determined until it was known what materials could be found available..."/2

For instance, as late as the latter part of 1918, there was still no clear picture of what was needed in the way of types of steel for guns, machines, vehicles, etc. And, there was no accurate estimate of how many of each of these items were needed.

As war production increased, several sections were added to the WIB to investigate additional available facilities and methods of stimulating production, to advise on plant extensions, and to examine areas for available manpower, transportation, plant capacity in use, etc. However, before this information was complete, the armistice was signed.

One of the more specific problems confronting the WIB was that of labor. Labor turnover (job hopping) was high throughout the war. The problem became acute toward the end of the war as both government agencies and war contractors began to compete with each other and among themselves for labor. The existing federal labor boards were not equipped to handle the kind or magnitude of labor problem presented. Competition for labor caused wages to climb and the war was ended before a satisfactory scheme for "wage fixing" could be put into practice, even though the necessity for it had been obvious from the beginning.

As one might expect, the lack of an adequate supply of steel was a continuous source of difficulty. This was one item that was in constant demand by our allies, the government and the consumer. The great demand and scarce supply drove steel prices beyond an acceptable level. Finally, a freeze was placed on steel prices. For some time steel manufacturers delivered steel with a price to be determined at some future time by the government. Then, the situation was further aggravated as many manufacturers began to experience delivery delays due to a lack of transportation. At the conclusion of the war Mr. Baruch noted:

> "...The early estimates were that only 17% of our enormous steel output (35,000,000 tons a year) would be required to supply all war needs. When this estimate is reviewed in light of government control during 1918 of 100% of our steel, and in light of the struggle to cover shortages which accompanied the control, one can realize the value which a peace-time bureau devoted to the collection of information might have had as a measure of preparedness."/3

/2 Ibid., p. 32.

/3 Ibid., p. 117.

In addition to a shortage of steel, the demand for copper and brass (due to the needs of our allies) was outrunning supplies for a full two years before we entered the war. Because the U. S. controlled the bulk of the world's copper, the basic problem here was one of stimulating production. Frequently, copper, just as steel, was delivered without price, while the WIB attempted to arrive at a fair price.

When it became apparent that a shortage of large machine tools was likely to be experienced, the machine tool section of the WIB was formed in October 1917. Unfortunately the machine tool industry was late in being added to the list of manufacturers with a priority for vital materials. Producers of new materials often had inadequate information on which to base machine tool orders. The WIB, as a stopgap measure, began surveying private plants in case machine tools had to be commandeered. Fortunately, the war ended before this became necessary.

One of the most incredible situations existed in the area of munitions, ordnance, and small arms. The WIB did not even create a division to handle this area until June 1918. Prior to the war, production of these items was restricted to a small number of plants situated in the eastern U. S. or near the Atlantic Seaboard. When the decision was finally made to expand these industries, the congestion in the eastern manufacturing district had become very serious. Power, transportation, labor and fuel were all in critically short supply. Clearly, had there been a central control over the distribution of orders and the expansion, this need might never have occurred. Additionally, there was little expertise available in this country concerning the manufacturing of trench warfare weapons and , as a result, U. S. recruits, who trained for 8-1/2 months before being sent to the front, were trained with wooden sticks. The 2 million Americans who went overseas could not have been supplied with guns of U. S. manufacture until the spring of 1919--two years after the declaration of war and six months after the armistice.

We entered WWI without the advantage of past mobilization experience. We recognized far too late the necessity for priorities, we allowed the purchasing of essential items to result in conflicting orders, and many essential commodities could not find transportation facilities. Often, when rail transportation was utilized, the goods destined for France arrived at their point of embarkation only to find that shipping was unavailable.

While different government supply activities competed against one another and continued to burden manufacturees with conflicting orders, these same manufacturers continued to grab at these orders knowing it was beyond their ability to fill them. Further complicating the situation was the force of political pressure exerted on government activities who awarded the contracts.

Most detrimental perhaps, was the lack of current, accurate information. At the beginning no one knew what or how much we had, where it was , nor how much more could be made available. More importantly, no one had any real measure of what we needed. No one saw the entire problem as one of finding the right raw materials and transporting those raw materials on schedule to the right manufacturers. All of this takes time, planning and, of course, control. Before we were able to accumulate this information and, just when the WIB was beginning to be effective, the war was concluded.

What did we learn from these experiences? The problems we faced did not go unrecognized. In 1920, Congress updated the National Defense Act and:

1. Authorized the Assistant Secretary of War to institute and take active charge of M-Day (mobilization day) planning and to conduct studies and formulate plans for the wartime mobilization of industry.

2. Created the Army and Navy Joint Munitions Board to coordinate the needs of the two services and thus prevent the disasterous competition for supplies which had crippled both services in WWI.

In addition, Congress authorized the Army Industrial College as a supplement to the Army War College.

The M-Day Plan was intended to avoid the fumbling and mistakes of 1917 by embodying our experiences from WWI and thereby eliminating a repetition of errors. Yet, in 1941, Mr. Hugh S. Johnson felt justified to write:

> "...But a strange reversal of that (M-Day planning) policy has been applied to industrial mobilization. We went straight back to 1917, re-created the old Council of National Defense with its inept and amoebic Advisory Commission, and fumbled along for just as many months. The War Department mobilization plan was hardly even considered. Every fumble and blunder of the World War mobilization was repeated...The astonishing thing is that all of this precious time should have been lost. The encouraging thing is that there may yet be time and that all this experience will not be wasted forever."/4

Mr. Johnson's accusations are serious and therefore bear closer scrutiny. It is important to understand what actually occurred in the intervening twenty years (1920-1940) that gave rise to this indictment, and to determine if such harsh words were in fact, justified.

A complete picture of that 20 year period is not easily brought into focus. While the facts will speak for themselves, they must still be viewed with an understanding of the economic, political and social climate of the nation, for these form the frame of reference in which all else occurred. It is here then that we should begin.

At the conclusion of WWI our industrial output had increased and the country was enjoying an unparalleled period of prosperity. At the same time, however, through various internal processes (i.e. taxation) we forced many of our war industries out of business. This prosperity (some called it "false") ended in the greatest depression this country has ever known. Our GNP dropped as much as 33% curing one year and at one point a total of one-fourth of our working force was unemployed. With the advent of President Roosevelt's "New Deal" and some innovative fiscal procedures we began to climb slowly from the depression. But it was not until after our entry into the Second World War that the economy actually recovered.

With the signing of the WWI armistice, the people and the Congress of this nation turned their eyes inward - they had had all they wanted of "foreign involvement." The defeat of President Wilson's efforts to join the League of Nations coupled with our abdication of a leadership role in world affairs, marked the beginning of the most severe isolationist period in our history. It is little wonder then, that the depression sweeping Europe had little meaning for us and that we overlooked the early warning signs of our future plight. Similarly, consumed with our own problems, we viewed only with slight interest the activities of Hitler and his massive armies as they began to literally swallow up small European nations. One of our few official acts, of an international concern, was the Neutrality Act of 1935 which placed an embargo on arms to <u>all</u> belligerants regardless of the justice of their cause. It was not untill September 1939 and then only after the fall of Poland that we began to slowly arm ourselves, but only as a means of avoiding war: Almost a year later, in June 1940 when France fell after a few days of fighting, the nation was finally shocked into action and Congress passed the Selective Service Act.

After a lengthy floor flight, Congress, by a very narrow margin, passed the Lend Lease Act in March 1941. This allowed the President to lend, lease, sell, or dispose of defense materials to any country whose defense he deemed vital to that of the U. S. Amazingly, it was not until November 1941, a few days before our entry into the war, that Congress finally repealed the Neutrality Act.

The significance of President Roosevelt's New Deal must not be overlooked, for it caused almost a complete break between the Administration and industrialists, those

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/4 Ibid., p xi

same men whose cooperation we later needed to ensure our victory in WWII. It also split Congress and the Administration for they were at different poles on the New Deal and the President's international policies. Neither the people nor Congress would believe, as late as November 1941, that we would for any reason become a party to the conflict in either Europe or the Pacific. Therefore our early efforts to mobilize for defense were halting and uncertain. Special political interests had to be placated, compromises affected and programs modified. It was difficult to organize a democracy steeped in isolationism and at peace for the eventuality of total war. The wealth of discussion, free expression of opinion, consideration of the minority point of view, and delayed acquiescence of the majority of popular opinion all consumed time and delayed decisive action.

Of the situation, Mr. Francis Walton wrote:

> "A measure of the blame for the poor results of the Defense Production program must be laid to antagonism between Big Business and the New Deal, between management and the Political Experimenters, between Industry and the White House."/5

Throughout the 1930's, Congress and the people thought that the nation was ready at a moments notice to convert to a fully mobilized fighting machine. Much of this feeling was generated by the existence of the M-Day Plans worked out to the War Policies Commission. These plans purported to contain a design for industrial mobilization organized along the lines and experiences of WWI. It was also felt that with our self-sufficiency of resources, availability of raw materials would pose no real problems. Mr. Brooks Emeny, researching this topic for the Harvard Bureau of International Research, reported the following in 1934:

> "It is evident from our analysis that, of the 26 different commodities, the problem of procuring which in time of war is considered sufficiently difficult by the War Department to warrant their being classified as 'strategic', no more than 5 or 6 of these are really of vital concern... there is no question but what the purchase of a stockpile for war, adequate to cover a large protion of the probable industrial needs, should be made in the case of manganese, with lesser amounts of chromite and tin... in the case of rubber, the purchase of a stockpile appears unwarranted at present."/6

Commenting further on the supply of rubber he said:

> "Rubber is by all odds the most important of the strategic raw materials belonging to the non-mineral group...it is indespensable to modern warfare...But on account of the size of our stocks on hand...and the progress which has been made in the development of adequate though more costly substitutes, our military position and security in case of war would be quite tenable, even granting a complete shutting off of normal imports."/7

Of manganese, vital to the production of steel, and one of our most critical problems in WWI, , Mr. Emeny said:

/5 Francis Walton, Miracle of World War II, (New York, 1956), p. 120.

/6 Brooks Emeny, The Strategy of Raw Materials: A Study of America in Peace and War, (New York, 1934), p. 166.

/7 Ibid., p. 132.

"There is no strategic mineral of the U. S. for which an absolute insurance of supply in time of war is more essential than manganese...National security necessitates, therefore, that a guarantee of procurement of this vitally important strategic metal be assured in case of war."/8

This then briefly represents the backdrop for the events that elicited Mr. Johnson's charges. A look at the events as they unfolded against this backdrop should complete the picture, for from a very meager start, we did produce 5,600 merchant vessels, 79,125 landing craft, 300,000 war planes, 41,000,000,000 rounds of ammunition, 434,000,000 tons of steel, 126,839 gun carriages and armoured cars, 2,400,000 military trucks, and 2,600,000 machine guns by the end of the war./9 First let us examine the efforts to plan and organize between the time we began to arm ourselves for defense in 1939 until our entry into the war in December 1941.

In total war it is impossible to separate the military, economic, and political aspects in matters pertaining to overall strategy and high policy. Only the President is in a position to coordinate all three. President Roosevelt, through the Reorganization Act of 1939, created the Executive Office of the President, giving him the Bureau of the Budget, the National Resources Planning Board, a White House Staff, etc. to assist in the coordination of these matters. However, it was soon proved that these bureaus, acting in an advisory capacity, were unable to cope with the situation; they just could not take theplace of responsible administrators holding delegated authority./10 One of the greatest difficulties facing the President was that of choosing men to direct the pre-war efforts. Of those few available, some were so antagonistic toward the New Deal that they could not be used, and still others could not adjust to thinking in national terms and working within government procedures./11

The highly touted M-Day Plans proceeded on four general assumptions:

1. That overall control of the war effort must be in the hands of the President.

2. That the administrative work of mobilizing for war production should be placed in a special war agency outside existing government departments and agencies.

3. That this could best be accomplished by businessmen and industrialists recruited for this purpose.

4. That a sudden transition from a state of peace to a state of war could be affected.

The M-Day Plans also called for a "War Resources Board" which the President promptly established in August 1939. Its report was never made public, however, either because the President considered it inadequate, or, due to the composition of the Board, it was in conflict with the New Deal Program.

Soon thereafter, the President re-established the Council of National Defense (May 1940) which had existed prior to WWI. At the same time he created a National Defense Advisory Commission (NDAC) to work with the council. The NDAC was to concern itself with seven problems: industrial production, industrial materials, employment, agricultural production, transportation, price stabilization and consumer protection. Unfortunately the NDAC had no one person in charge and this led to considerable confusion. Additionally, as an advisory body, they had no real authority. The Commission did discover, however, that the M-Day plans lacked concrete data, contained the barest suggestion of procedures, and that they had to begin again.

/8 Ibid., p. 42.

/9 Francis Walton, Miracle of World War II, (New York, 1956).

/10 James D. Magee, William J. Ronan, Emanuel Stein, Our War Economy, (New York, 1943).

/11 Ibid.

The Office of Emergency Management (OEM) (May 1940) was placed in charge of most of the early war agencies. As a part of the Executive Office of the President, it was billed as an agency to advise the President in the discharge of his extraordinary responsibilities brought on by emergencies. Its true purpose was not announced because of the opposition to anything that hinted that the nation might be preparing for war. The NDAC, reporting to the OEM, was divided into two camps, one that thought the nation's plant capacity was adequate and the second which held that the productive effort required would mean increasing and converting facilities and curtailing civilian output. Then, several months later, the Office of Production Management (Dec. 1940) was created to increase defense production, fix priorities, and analyze defense needs. As prices began to rise and inflation set in, the Office of Price Administration and Civilian Supply was created. In August 1941 the Supply Priorities and Allocations Board was established to iron cut the difficulties and conflicts of the other boards. None of these boards had the authority or the central leadership to be effective. Finally, five weeks after Pearl Harbor, the War Production Board (WPB) was established. The board absorbed most of the other boards and continued to function throughout WWII. These then were our attempts to organize before the conflict. But exactly what was our status as far as available resources and production just prior to our entry into the war?

This question could not be answered with any degree to certainty until far into WWII. Donald M. Nelson, the chairman to-be of the WPB, made an estimate of what we needed and what we had as of January 1940./12 First he felt we needed a large and well equipped Army. He concluded that we did not have such an Army and that, in fact, on 1 January 1940, when half of the world's population was in an official or unofficial state of war involving more than one-half the area of the world, the U. S. had an Army inferior in size to that of Poland. Poland fell to the Wehrmacht in less than a month. He indicated that time was needed, time to decide that we needed a mass Army, time to convince Congress, and time to train the Army in modern warfare.

Second, we needed a strong Navy to protect our shores and our maritime interests. He concluded we had the best Navy in the world at that point in time (Pearl Harbor and German wolf packs were still things of the future.)

Third, we needed great reserves of military and industrial power. He concluded that few nations equalled us in this regard. But time was needed to convert facilities to war production and to train industrial manpower.

Fourth, we needed a munitions industry. He concluded we had virtually none and that it would take time to build one. After WWI we had crecked down on the "munitions barons" who had developed their skills and resources to such a degree that they frightened the rest of the world and ourselves as well. Bethlehem steel, at the end of WWI, was making almost everything needed to throw at the enemy as well as everything needed to throw it with. Postwar taxes forced Bethlehem to physically destroy its whole munitions empire. Remington, our biggest rifle manufacturer, similarly lost its biggest plant. Shipyards went out of business, the merchant marine dwindled to a shadow, machine gun plants and the beginnings of an air industry disappeared, and then we began to sink our warships. We did not begin to re-arm until a few months before entering the war and this was mostly due to purchase orders received from our allies.

Fifth, we needed raw materials. We had enough of some and not nearly enough of others. We again needed time to procure or synthesize the raw materials we lacked. The optimism formerly expressed regarding our raw materials situation was ill founded. Rubber and aluminum proved to be our big problems even before we entered the war. A lack of manganese caused a steel shortage throughout the early years of the war (this

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/12 Donald M. Nelson, Arsenal of Democracy, (New York, 1946).

in light of the common knowledge of its importance and the fact that we had the same problem in WWI). Even more incredible, in June 1939, Congress authorized $100 million for the stockpiling of rare and essential commodities, yet a year later this project had barely begun. Again, as in WWI, our machine tool industry posed a problem. We had too few firms involved in this work and precision tools take time to make. Without them mass production is impossible. Again the importance of this industry was not realized until well into the war.

Within a few weeks after the formation of the Office of Production Management (OPM) in January 1941, it replaced the NDAC. Bernard Baruch was invited to speak to the commision about his WWI experiences. Mr. Baruch once again mapped out the problems encountered in WWI, explained the necessity for centralized control and the need for a priorities system, and price and wage controls. Mr. Nelson as coordinator of Defense Purchases for OPM before becoming the Chairman of the War Production Board was present when Mr. Baruch spoke and some years later commented:

> "It is my opinion that hundreds of millions, perhaps billions, of dollars could have been saved and many headaches avoided if his (Baruch's) recommendations had been adopted from the start...we are too slow in taking advantage of other men's experience."/13

The OPM had little more authority than did NDAC and Mr. Nelson believed that this was primarily due to the attitude of Congress and public opinion. It failed for the same reasons as NDAC--you just could not convince people that the nation was about to fight a war. The steel industry resisted the possibilities of priorities or the need for allociations for months. Congress delayed additional production because of disagreements over where to put the plant sites. Mr. Nelson said later:

> "I have always believed that the virus which brought the agency (OPM) to its state of invalidism was its inability, or its unwillingness, to cope with the related issues of materials, priorities and allocations."/14

Such was the situation on 7 December 1941. Mr. Nelson described the next five weeks, during which frantic efforts were made to organize for war, as follows:

> "It was not a process with which Americans were familiar...There was meeting after meeting, plan after plan, by the men who had been working on defense preparations for a year and a half, and by reinforcements which were gathering in Washington. Yet we all knew that there was something confused and aimless about our exertions; a lack of integration which tended to nullify the abundant spending of energy. We knew that sufficient progress was not being made and that every minute wasted by us...was five minutes gained by...the confident enemy...We were in trouble."/15

At the end of this five week period the President decided to create the WPB and appointed Mr. Nelson its chairman. Mr. Nelson was asked to draft his own Presidential Order for the signature of the President, and the one he wrote clearly defined the powers and functions of the WPB. Thus a central agency with authority finally came into being.

/13 Ibid., pp. 90-91.

/14 Ibid., p. 130.

/15 Ibid., p. 7.

Mr. Nelson and the WPB assumed responsibility for converting the nation to a full wartime status. Their job was threefold:

1. To chart for our own forces and those of our allies, the requirements for materials, men, and machinery for each part of the economy.

2. To ascertain exactly what our resources were, where they were located, their condition, and determine their adaptability.

3. To then match requirements against the resources and to balance the whole.

Nelson recognized early in the game that all of this had to be accomplished without destroynng the basic system of free enterprise. The Divison of War Industry Operations of the WPB was responsible for operating the priorities system and for showing industry what had to be done--not hwo to do it. The Controlled Materials Plan, which came into being late in the game, assured industry of getting what they needed when they needed it.

Under the circumstances, the achievements of industry and the WPB were almost miraculous. For instance, the entire automobile industry of some 30 manufacturers was almost 100% converted to the war effort. This had the effect of virtually destroying the entire automobile industry. They furnished 20% of the total war production including aircraft engines, tanks, machine guns, diesel engines, and all of the Army's motorized vehicles.

The WPB supervised the creation of over 81 shipyards at a cost of $500 million to the government. In 1939 we had 1,150 oceangoing vessels. By 1945 we had 5200 large ocean-going vessels and innumerable smaller craft even though during most of the war, we lost more than we could build.

Labor was recognized as one of our most important resources. At the outset of the war unemployment was high and there was a large reservoir of people. Over five million unemployed men and women were classified by the U. S. Employment Service according to trades and skills. It did not take long for this reservoir to evaporate. Training of civilian workers also posed quite a problem. A case in point is the large number of welders that had to be trained when it was discovered that the ships' riveted plating could not withstand the exertions required during naval operations. The labor vacuum was eventually filled by women and Rosie the Riveter was born. Manufacturers were reluctant to hire women in positions that had traditionally been held by men and procrastinated for months before agreeing to accept women employees. Instead they continued to appeal to the Selective Service Boards to release male employees from induction. When this failed, they finally hired women. The problem of "job hopping" plagued all industries as it did in WWI. The WPB finally enacted measures partially 'freezing' labor. The usual labor vs. management problems also existed, but to their credit, most of these were resolved locally with a minimum loss of production.

The problem of finding people to run the WPB was resolved by hiring approximately 300 'dollar-a-year' men from industry and civilian institutions. To their ceedit, these men suppressed any antagonism they might have had toward New Deal policies. They managed to adjust to government procedures, stood up to public scrutiny and criticism, and functioned well in spite of the fact that Congress openly distrusted them. These men did a magnificent job.

As in WWI, one of the biggest problems was determining requirements so that materials production and transportation could be properly scheduled. The WPB finally gained control of the this situation in 1943 but was hindered throughout the war by conpanies that persisted in hoarding materials.

Unfortunately, the stabilization of prices and wages and the rationing of consumer goods were implemented too late to avert shortages and prevent and curb runaway inflation. Once again, Mr. Nelson wished he had taken Mr. Baruch's advice and initiated controls almost immediately; for it took the WPB almost two and one-half years to effect

supply and demand controls. Despite the delays, we managed to get the job done. The price paid by industry, the taxpayer, and the consumer was far higher than necessary, and, if we had not had the time to get into gear, all of these sacrifices, willing and unwilling, would have been useless.

We learned many lessons from WWII. First, we learned that there must be a mobilization policy and a realistic plan to carry out that policy. Mr. Nelson said, long after the war, (as Mr. Baruch had after WWI):

> "I believe it has been made plain that despite the setting up of various war agencies...we did not have adequate planning for war until sometime after we were in the thick of the fight."/16

Second, there must be an accurate, updated, information base from which to develop and implement these policies and plans. Two world wars have found this nation at a loss as to what we need, what we have, the location of what we have, and how much more we can get.

Third, a centralized organization with sufficient authority must coordinate and control these efforts. In this way, needed actions (i.e. wage and price controls) can be taken early enough to prevent early shortages and damaging inflation.

Fourth, as indicated by Mr. Johnson, it was clearly demonstrated that there is something to be gained from our past experiences:

> "When the record of industrial control in the war just concluded is reviewed against the background of the experience of the War Industries Board (1917-18) it is impossible not to be impressed by the extent to which history repeated itself...In spite of this similarity (of the problem) however, many of the mistakes in the administration of controls in 1917 and 1918 were repeated in 1941 and 1942. Each new production or material control problem was approached as if there were no fund of experience on which to draw. Time after time, the administrative and procedural blunders of the earlier years were reproduced in new settings."/17

After the conclusion of WWII, even with the cutback of war production, the general level of prosperity was maintained. During those few years preceeding the Korean conflict, history began to repeat itself. Our munitions industry dwindled, shipyards closed, ships were mothballed, and the size of our armed forces was drastically reduced.

There were some differences however. Neither Congress nor the people turned from international responsibilities. Public Laws 472 and 793 (1948) provided for government stockpiles of scarce materials in the amount of $3.7 billion. Unfortunately, at the outset of the Korean conflict, only 22% of this had been expended.

Seymour E. Harris, Professor of Economics, Harvard, in regard to the ready supply of raw materials in 1950 wrote:

> "It is clear that shortages are serious. Unless adequate supplies of tin, copper, manganese, nickel, etc. are found, both the national economy and the mobilization will suffer."/18

/16 Ibid., p. 391.

/17 Melvin Anshen, David Novick, W. C. Truppner, Wartime Production Controls, (New York, 1949), p. 3.

/18 Seymour E. Harris, The Economics of Mobilization and Inflation, (New York, 1951), p. 51.

Finally, the Defense Production Act of 1950 gave the President authority to fix wages and prices and determine priorities and make allocations of essential materials.

Because Korea was limited action, an all out war production effort was not required. A Mobilization Director was appointed but had little authority. Eventually, wage and price controls were instituted and a skeleton control system was established. Before the outbreak of hostilities the economy was close to full employment (about 5% of the labor force was unemployed); therefore prices climbed rapidly and controls were needed to curb inflation. This time the delay in enacting wage and price controls directly contributed to the recession this country experienced at the conclusion of the conflict.

Additionally, the limited control policies introduced were weak, inadequate, and unenforced. All of this gave rise to Mr. Harris' conclusion that we did a much poorer job of controlling resources during Korea than during WWII. Much of this failure is once again directly attributable to lack of planning and inadequate authority. But here too, a new element was introduced. He said in part:

> "As difficult as it was to enlist adequate controls in WWII, it will be much more difficult to mobilize them in the fifties. I do not mean paper controls, but controls that are acceptable and enforceable. With the country short of full mobilization and the crisis of uncertain duration, the fist-pounding type of controls will not prove very effective. With the public reluctant to abide by regulations, the only way out would be a stabilization gestapo for which the American people are certainly not prepared."/19

The war was not particularly popular and people as a whole did not feel compelled to abide, at least strictly, with the limited controls imposed. They felt that the war industry was taking too big a bite from consumer production and too much government spending was being applied to the war effort.

At the cessation of the hostilities this country once again reduced its Armed Forces, dismantled a partially rebuilt war machine and began to look upon foreign entanglements with increasing suspicion.

Between 1952 and the Viet Nam build-up in 1965, an old and familiar pattern began to evolve. Defense production and military procurement once again became a partisan political issue. In 1952, RADM R. L. Long, USN, Acting Vice Chairman for Supply Management of the Munitions Board described for the House Armed Services Committee the problems which various procurement policies posed for the individual procurement officer:

> "Congress has enunciated a small business policy, Mr. Wilson has issued a directive...which says, 'Let's give special attention to distressed areas.' We have a big programof offshore procurement. We have a statute called the Buy-American Act. We have today...at least 14 major policies under which your purchasing officer today is working...there are factors which are going to affect every single procurement that is made. Yes, you have price control. Yes, you have people who would say, 'Negotiate all your contracts so that you can direct your contracts to small business or to a distressed area.' You have also got a committee of this House, a committee of the Sensate, select committees on small business...If you would ask me today, if I were a purchasing agent, which one of these directives I would follow, I would tell your(sic), sir, that I would follow the one on which the pressure was the greatest right now, and then duck."/20

/19 Ibid., p. 17.

/20 William L. Baldwin, The Structure of the Defense Market 1955-1967, (Durham, N. C., 1967), p. 51.

In 1963 Seymour Melmar, Columbia University, estimated that the machine tool stock of the U. S. was older than that of any other industrialized nation./21

In 1964 we began to buildup our operations in Viet Nam. The initial requirements for military hardware were easily met because of large inventories and the available capacity. Neither wage and price controls nor production controls were instituted. We failed to face the problem of priorities and manufacturers soon could not meet demands for real output for non-defense use. The failure to take steps to restrain civilian consumption and government non-defense expenditures caused open competition for products; thus raising prices and causing severe inflation.

Like Korea, this war too is unpopular. Perhaps one of the reasons for its unpopularity is the inflation which has resulted. As the war effort increased more war materials were required and the government once more found itself competing with the consumer. Prices and wages both began to rise. As prices increased, the government was spending more and more for war materials and less for domestic projects. There is no logical explanation for the failure once again to initiate some kind of responsible controlling measures.

As before, we found ourselves in a shooting war with an ill-equipped and short-supplied fighting force. We were forced once again to spend great amounts of money to hurriedly procure ships, landing craft, and other war items in sufficient numbers to handle our needs. The buildup took time and it was expensive.

As we withdraw from Viet Nam we find the beginnings of a new call for isolationism. We find antagonisms over policies between the administration and Congress. There are great pressures to reduce defence spending and research and we have scrapped obsolete ships with no plans to replace many of them. Manufacturers of war materials are under great pressure and many of them are disappearing from the business scene. We are yearly reducing the size of our armed forces and pressures are being exerted to withdraw from our standing international agreements. What then are our plans and preparations for future mobilization?

In 1963 the Office of Emergency Planning (OEP) (see Appendix II) recommended the establishment of a standing agency, the Office of Defense Resources (ODR), to oversee Federal efforts for full scale mobilization. Accordingly, in 1964 ODR was established. Then in July 1966, the OEP furnished a Reserve Mobilization Plan for Limited War. The principles of the plan include the idea that concurrent with our physical survival will be the survival of our basic value system. OEP has a "ready draft" of the "Defense Resources Act" to submit to Congress for their approval should we have to mobilize. This act provides authority for price and wage stabilization, expansion of productive capacity, etc. Mr. Baruch strongly urged the OEP to secure standby legislation in advance of an emergency and thus avoid delays from Congressional debate at a critical period. But it remains in draft form with the hope that Congress will approve it quickly. If Congress delays we may find ourselves once again well into the fighting before being able to effect vital controls.

The ODR (see Appendix III) will be the staff arm of the President. The Director will be named by the President when the agency is activated and will direct and coordinate the entire resource mobilization effort. The OEP will be abolished and its personnel transferred to the ODR.

The Director of the ODR will be assisted by the Defense Resources Board. This Board will be composed of the heads of Federal Agencies having mobilization responsibilities (e.g. Department of Labor). The development of each particular program will rest with the agency responsible for putting it into effect. The ODR will provide the necessary policy guidelines and directions. The basic plan does not call for additional personnel in these agencies. In both World Wars standing Federal Agencies

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/21 Ibid.

were unequal to the magnitude of the additional tasks imposed by mobilization. I suggest that it is very likely that this same situation could occur again.

During an emergency every major production and service sector of the national economy would be assigned to some Federal Department or Agency which will be known as the controller or resource agency. During a declared emergency the resource agencies would have the power to regulate and control to a much greater degree than that implied in their statutory peacetime roles. Again, the responsibility is placed with an existing agency, and the additional workload will be superimposed on an already heavy routine workload. No provisions are made for an information base. All data will come from "current statistical data." We will once more find ourselves with much useless information. It has been proven repeatedly that mobilization information has never been available from normal or currently available statistical data (i.e. how many tanks can 15 automobile manufacturers produce in the first year?)

So, in 1971 we find ourselves with a paper agency. This agency will function if and when Congress passes the appropriate legislation. I cannot help recalling that Congressional legislation was a problem in both World Wars. We find the nation relying once again on existing Federal Agencies to accomplish both the mobilization and control of resources when this system has failed twice in the past. There are no provisions for gathering the very information upon which a successful mobilization is predicated. We have yet to take positive action to acquire stockpiles of vital war materials.

The only conclusion that can be drawn is that in the past sixty years we have indeed made little progress and that we are dedicated to the repetition of certain acts. Given the world situation, we are today no better prepared than we have been in the past.

The one remaining issue is that the plan described above is one which will become effective during a limited conflict and will be expanded as required. But to date, this nation has no plan for total resource mobilization because it is felt that recurrence of a long drawn out conflict on a major scale requiring total resource mobilization would seem to be almost inconceivable./22

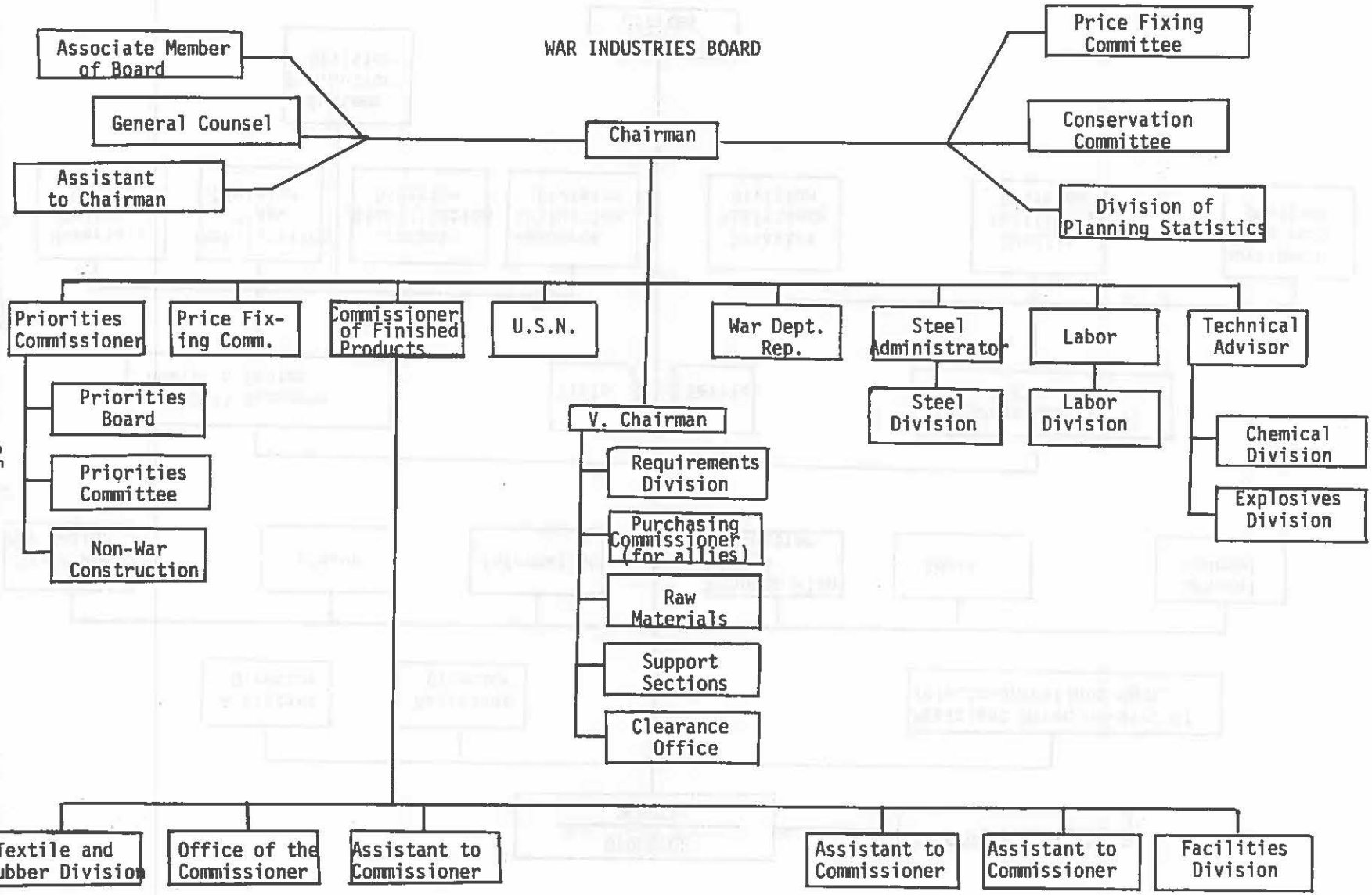
Mr. Avery E. Kolb, Executive Office of the President, said:

> "Although existing mobilization plans provide for direct controls no statutory authority exists today for bringing them about. Bernard M. Baruch and Senator H. E. Capehart pointed to this problem in 1953 when they sought to retain, on a stand-by basis, the control authority vested in the President by the Defense Production Act of 1950. To be effective, authority for direct controls must be available in advance so as to be applied with a fine sense of timing. The general atmosphere of 1968, however, was such that the President would hesitate to ask for, and the Congress would be reluctant to give, powers of direct economic control. Should the nation approach those levels of danger where dynamic and positive action may be required, there is concern that the government will not be able to act or will not move to act in time..."/23

Some of the oldest religious writings record that a man named Baruch helped Nehemiah rebuild the defenses of Jerusalem. Generations later a man named Baruch repeatedly exhorted his king to prepare for an invasion. The king refused, and when Baruch persisted, publicly burned the scroll containing the warnings. Baruch later rewrote it from memory and hid it so that it could not be destroyed. He, however, continued to repeat his warnings up to the end of the bitter disaster. Hundreds of years later another man named Baruch repeatedly warned his government regarding the defenses of his country and he too has been ignored.

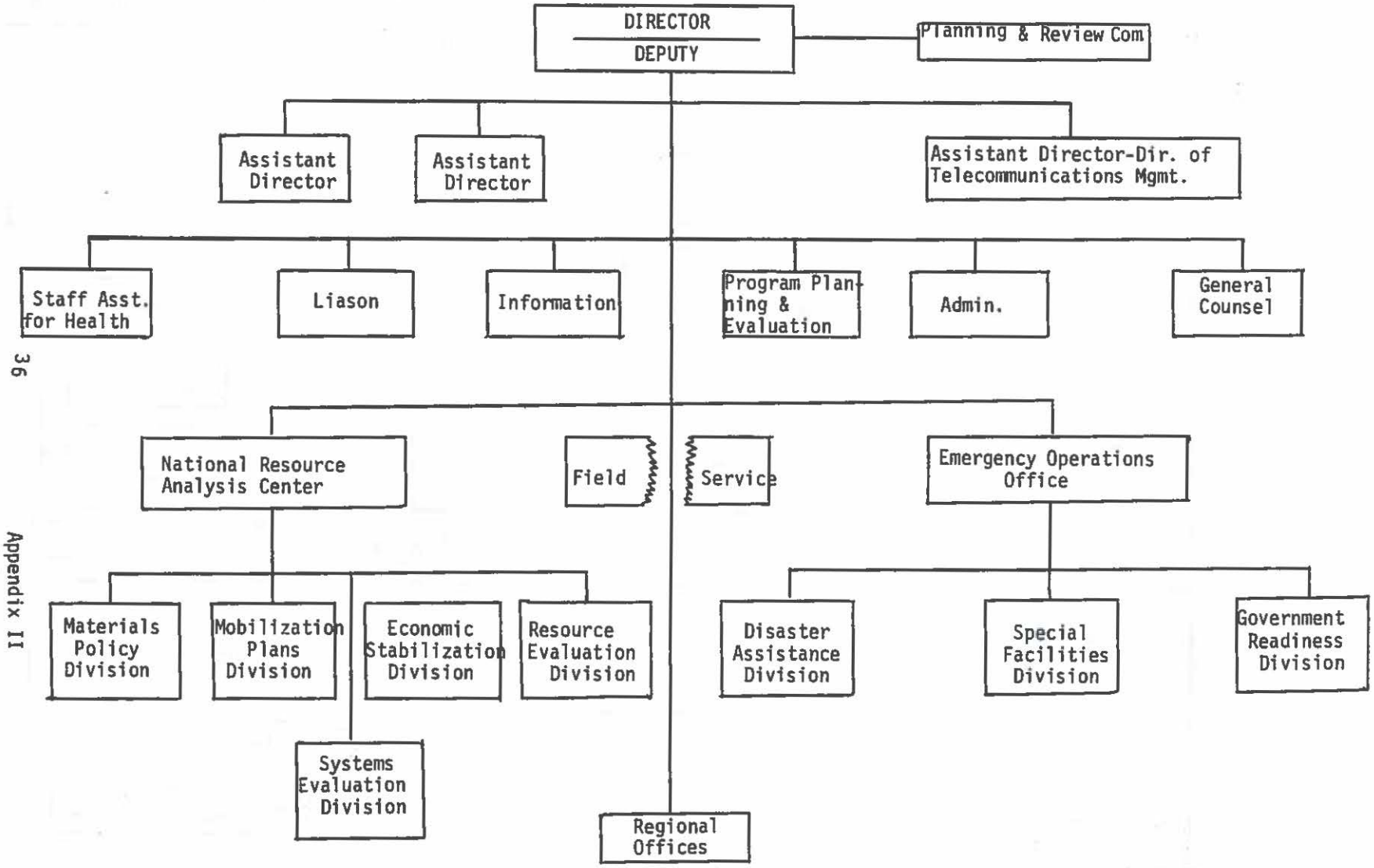
/22 Avery E. Kolb, Emergency Resource Management-Limited War, (Washington, D.C., 1969).

/23 Ibid., p. 55.

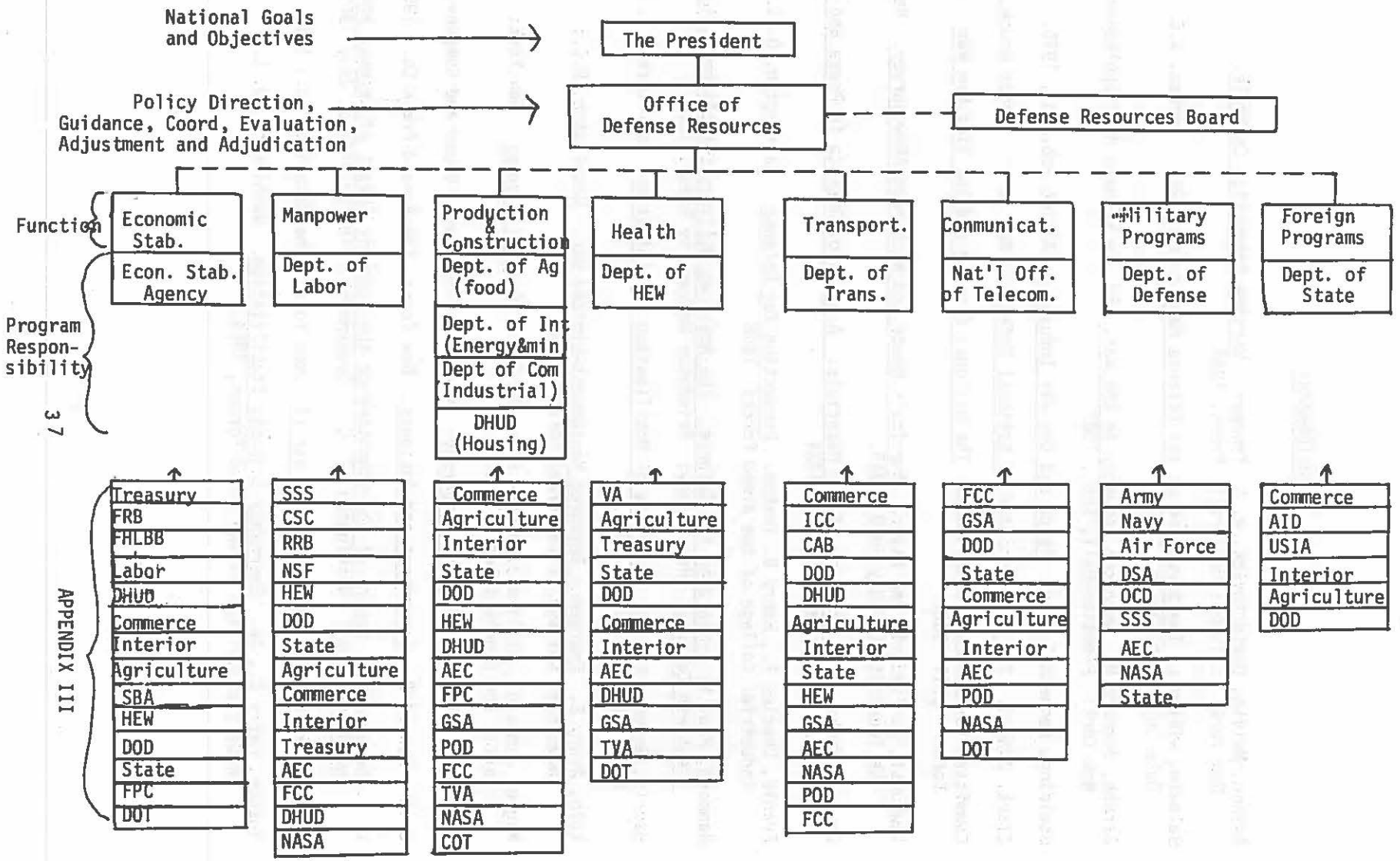

WAR INDUSTRIES BOARD
Associate Member of Board
General Counsel
Assistant to Chairman
Chairman
Price Fixing Committee
Conservation Committee
Division of Planning Statistics
Priorities Commissioner
Price Fix-ing Comm.
Commissioner of Finished Products
U.S.N.
War Dept. Rep.
Steel Administrator
Labor
Technical Advisor
Priorities Board
Priorities Committee
Non-War Construction
V. Chairman
Steel Division
Labor Division
Chemical Division
Explosives Division
Requirements Division
Purchasing Commissioner (for allies)
Raw Materials
Support Sections
Clearance Office
Textile and Rubber Division
Office of the Commissioner
Assistant to Commissioner
Assistant to Commissioner
Assistant to Commissioner
Facilities Division

APPENDIX I

OFFICE OF EMERGENCY PLANNING



PRIMARY STRUCTURE FOR CENTRAL RESOURCE MANAGEMENT (LIMITED WAR)



APPENDIX III

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A SURVEY OF ENCOUNTER GROUP THERAPY AND ITS APPLICATION IN THE INDUSTRIAL SETTING

by D. R. Lynch

As a means to obtain a better understanding of oneself in interpersonal relationships, many have turned to sensitivity or encounter group training. The author traces through some of the benefits of such group training in improving interpersonal relationships; however, he points out that its success in industry is contingent on overcoming several obstacles.

D. R. LYNCH, LCDR, SC, USN; B.A., 1960, Bucknell University; Candidate for M.S. in Management.

Term paper submitted to Associate Professor John Senger for Individual Behavior, MN 3110.

Tact, repression of aggressive tendencies, and personal restraint are generally held to be marks of the "well-bred" individual by our society and, indeed, by practically all advanced cultures in the world. It would be hard to imagine living comfortably in a society where all members freely and openly expressed their opinions concerning the dress, mannerisms and general carriage of the people with whom they came in contact. These opinions do exist as the content of any past cocktail party monologue by the typical American wife will reveal. Fortunately, however, such feelings are rarely verbalized to any but the most trusted companion!

This fact contributes to harmonious relations in our society and certainly few people would desire this tendency to change. However, there is a certain deleterious effect on communication as a result of the "masks" that we all wear. As we pass through our daily interpersonal relationships, we are rarely fully aware of the effect our actions have on those with whom we come in contact. Conversely, we leave these same individuals in the dark with regard to how they "come - on" in their relationships with us. Of course, we all get some feedback; the boss or professor provides a portion, but this is usually performance related. On the more subtle side, we may feel that we are not getting optimum performance or receiving a high degree of loyalty from our subordinates, but we are usually at a loss as to why. To quote an advertisement by a toothpaste company several years back seeking to cure halitosis in the U. S., "even your best friend won't tell you!" In general, then, we are all basically amiable people who are conscious of the feelings of others, and this attitude will not likely change.

However, during the past ten to fifteen years there seems to be a movement by many people to strive for a more open, down to earth posture in their interpersonal relationships. To achieve this goal, many have turned to a relatively new therapeutic method known as encounter groups. These groups are known by other names such as sensitivity groups, T - groups, marathon groups, and self-study groups. They take on a variety of forms from brief one hour discussion groups to non-verbal "do-your-own-thing" sessions to two to four day marathon sessions involving a minimum of break in continuity of group interaction.

The idea of sensitivity training, or encounter groups, is actually about twenty-five years old and was reportedly discovered by Kurt Lewin./1 In 1946, Lewin and several colleagues were involved in developing a group relations training program for Connecticut State employees and one evening were discussing the progress of the trainees. Three of the trainees innocently came upon the meeting and asked if they could listen in on the proceedings. Lewin admitted them and the discussion went on as if the three trainees were not there. When the progress and behavior of one of the trainees present came up and a disagreement among the training staff ensued, the trainee became extremely excited and proceeded to relate her interpretation of what had actually occurred during the particular session in question. Lewin was apparently so impressed with the candidness of the confrontation and the factual data the discussion provided that he and his colleagues felt encounters such as these had enormous potential in the field of group therapy and warranted further study and development.

It actually has been in the last seven to ten years that encounter groups have become popular as the following statistics reflect./2

Sponsoring Group	Approximate Participation (year) 1962	1965	1970
Esalen		600	11,000
National Training Laboratories	900		2,400
Tavistock		100	250

The budget of the National Training Laboratories (NTL) has grown from a modest $300,000 in the early 1960's to approximately $3,000,000 during the latter portion of the period. Further, as of 1970, NTL had 150 separate sensitivity training programs. Carl Rogers sums up the surging interest in encounter group therapy with the following quote: "It is a fascinating fact that with almost no support from universities, little recognition from academic people, and no support from government grants basic encounter groups have become the most rapidly growing psychological trend in our culture."/3

/1 Back, Kurt W. "Sensitivity Training: Questions and Quests." Personnel Administration, Jan - Feb '71, Vol 34 (1) p. 22.

/2 Monthly Labor Review, Dec '70, p. 13.

/3 Bach, G. R., "Marathon Group Dynamics: I. Some Functions of the Professional Group Facilitator." Psychological Reports, Jun '67, vol 20 (3-1) p. 995.

It is important to note that group therapy of the encounter variety is not for the mentally diseased. Groups are comprised of college students, management and supervisory personnel, religious leaders, educators, and special sessions for married couples./4 Particularly significant has been the curiosity in this form of personality and management development by American industry. Of the 150 current National Training Laboritories programs, thirty-six have been explicitly developed for business executives./5 Several years ago, the American Management Association (AMA) instituted an Executive Action Course, three weeks in length, patterned after sensitivity training methods. In addition, the AMA's President's Association has developed a course for chief executives of firms and recently launched the "Presidents' Lab for Wives"./6 Organization development departments are springing up in many U. S. firms, and, as of 1970, 10,000 behavioral scientists are on corporate payrolls./7 Following a survey of basic encounter group methods, format, and results, a review will be made of the use of sensitivity therapy in industry and its adaptibility for the industrial setting.

My research for this paper indicates that most practicing psychotherapists are in favor of the encounter group approach. Arthur Burton speaks of the somewhat limited interchange that often typifies individual therapist/client treatment in the following quote: "The limits set on acting-out, loving-out, and living-out, the careful guarding of the therapist's own person, the rigid temporal parameters, the hush-hush conspiracy about money, the authoritarianism of the interpretation, the morality play, among others, have always been covertly resented by the client." /8 He goes on to state that during the encounter sessions these barriers are thrown out as the patient gradually overcomes his initial reservation and joins with his group members in the dynamics of open interpersonal communications. George R. Bach refers to this phenomenon as "psychological fertility"/9 and credits group pressure, rather than individual psycho-therapeutic efforts, as being the primary vehicle in moving clients toward open honesty and spontaneity in interpersonal relationships./10 Frederick H. Staller sees the goals of encounter groups therapy as "growth and change, new behavioral directions, the realization of potential and a heightened self awareness." He views the marathon or encounter group as more effective than individual psychotherapeutic sessions in increasing the individual development progress because of the interpersonal contact, crises, and free exchange of views between members that characterize the encounter group./11

Before going further, it would be well to survey the operations of the typical encounter group and relate this to the benefits derived from such experiences by the participants. The marathon group will be used as the basic guideline as it is felt to be the most valuable of the group therapy methods because of its length. Bach feels

/4 Burton, A., Encounter, San Francisco, Jossey-Bass Inc. 1970, p. 9.

/5 Berkwitt, G. J., Behavioral Science, Is the Cure Worth It, Duns Review, May 1970, vol 95 (5), p. 39.

/6 Ibid, p. 40.

/7 Ibid

/8 Burton, A. Ibid, p. 12

/9 Bach, G. R., The Marathon Group: Intensive Practice of Intimate Interaction, Psychological Reports, June 1966, vol 18 (3), p. 998.

/10 Ibid, p. 995.

/11 Burton, op cit, p. 3.

that in the shorter (one to four) hour group encounters, many participants never reach the level of confidence and group trust that permits them to openly vent their emotions /12. In the longer sessions, clinical evidence shows that practically all participants shed their masks and roles, either as their confidence builds or through group pressure to cooperate and open-up./13

The marathon group generally consists of from ten to fourteen members who pay anywhere from $90 to $300 for a concentrated two to four day session, usually held in a secluded setting. As a general rule, one or two leaders or facilitators are present to provide minimum guidance to the group.

Usually the group is faced with no agenda and little or no guidance from the leader. This is an unnerving experience in itself but leads the group through a series of reactive phases culminating in open exchange of feelings which is best summarized by Carl Rogers:/14

1. Milling Around - The leader announces that the group has unusual freedom and that he will take no directional leadership. As the group introduces themselves and searches for an agenda, frustrations develop, members are often ignored as they attempt to launch the group onto a subject, and the leader is frequently attacked for his passive position in the group.

2. Resistance - As the group enters this phase, some members may attempt to reveal a personal feeling, but there is general mistrust among group members which is quite apparent to the experienced observer.

3. Recalled Feelings: At this stage, the barriers to complete openness are still apparent, but many members begin to reveal feelings about people and situations outside of the group. Negative feedback begins to develop at this stage.

4. Revealing Self: This is the beginning of effective encounter as a member sees that the negative reactions experienced during the RECALL phase actually did no harm. He begins to feel a part of the surge of the group toward openness. People also begin to realize the effect they have on the other members.

5. Here-and-Now Trust: At this stage, the feeling of freedom is at its height and members enter into the previously avoided area of revealing personal opinions about others in the group. The group is now thoroughly embroiled in the desired intimacy of interpersonal relations.

Rogers mentions other levels and ancilliary outputs or developments, but the above list serves to depict adequately the progress of the typical encounter group.

/12 Bach, op cit, p. 995.

/13 Rogers, Carl, The Group Comes of Age, Psychology Today, Dec 1969, vol 3 (7) p. 30.

/14 Ibid.

The basic goal of marathon group therapy is to provide a learning experience whereby the individual can become more transparent, can increase his capability to level or be frank with those with whom he comes in contact, and can develop the ability to expose his inner self to group pressure and influence. Having coped with these rather new sensations, his real value from the experience comes from his realization of how he affects other members in the group and the ability to practice new or different types of behavior on the group members./15 As mentioned earlier, little direct psychological feedback is received in the daily routine of our lives. But if the group successfully reaches Rogers' "Here-and-Now Trust" plateau, the individual member receives considerable feedback as to how he interrelates with society. It does not take long for comments to develop like: "The trouble with you, Johnny, is that you have no guts." "I took an instant dislike to you the first moment I saw you." "I like your warmth and your smile."

The group leader or facilitator usually takes on a passive role, leaving the group to develop the agenda and general dialogue.

The writings reviewed all stress that effective therapy in the marathon group is only reached when the discussions center on the "here-and-now" orientation. This is a difficult stage for most individuals, and thus, the group, to attain. We are not accustomed to sharing our emotions freely and even less given to complete and open frankness. How then can the group gravitate to the level of sharing whereby each member can gain a clearer understanding of himself as well as improved interpersonal skills?

To begin with, marathon group members must have a sincere desire to make significant changes in their customary ways of behaving and acting in their real-world surroundings./16 Further, they must be willing to expose their personalities to others ./17 Surely, without this joint desire among group members, the group would be fortunate to arrive at Rogers' "Recalled Feelings" level. Bach effectively cites the necessary desire of group members in the following quote: "The Marathon group-therapeutic experience is most fully effective with those who wish to exchange their own ways of acting and being in this world and who are ready to quit blaming others and environment for their present unsatisfactory lot."/18

Given that a particular marathon group is comprised of individuals who sincerely desire to change their interactive behavioral patterns, some participants still have difficulty in shedding the social mask that they maintain in their real world contacts. Dialogues taken from marathon sessions show that group pressure is at first tender, but later often develops into angry, aggressive insistence. This is the most successful means by which an individual member is forced into the open. Usually the reticent member is attacked for not cooperating with the group's effort to get to the heart of the matter with regard to interpersonal dialogue. Not only does the aggressive dimension facilitate complete participation of all group members, but it is generally felt to be helpful in all phases of communication in the successful encounter group. Bach and Hart developed ten adjective-dimensions of helpfulness in group encounter, and incorporated them into questionnaires designed to elicit descriptions of persons cate-

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/15 Bach, G. R., The Marathon Group: Intensive Practice of Intimate Interaction Psychological Reports, June 1966, p. 996.

/16 Bach, G. R. Ibid, p. 998.

/17 Glueck, W. F. Ibid, p. 504.

/18 Bach, G. R. Ibid, p. 998.

gorized as "most helpful" and "least helpful" in the opinion of recent marathon group members./19 The adjective-dimensions are cited below:

Most Helpful

1. Empathetic Identification (similarity)
2. Acceptance-warmth (affectionate inclusion)
3. Self-Understanding (insight mediation)
4. Problem Solving (reality orientation)
5. Aggression-Confrontation (conflict acceptance)

Least Helpful

6. Strangeness (unlike me)
7. Non-Caring Indifference (alienation)
8. Narcissism (artistic preoccupation)
9. Disjunctive Communication (irrelevance)
10. Aggression-Phobia (conflict evasion)

One-hundred and twelve former marathon group participants responded to this questionnaire. The respondents were requested to indicate how others in the group were most or least helpful to them as well as how they felt they were most or least helpful to others in the group. Aggression-confrontation was ranked second among the behavioral dimensions in the category of most help given to others. Aggression-phobia or conflict evasion, on the other hand, was ranked highest among the least helpful dimensions exhibited by others in the group and a close second when describing the respondents own least helpful tendencies./20 Apparently, then, as repugnant as over-aggression is in our society, it is felt to be a necessary vehicle in eliciting effective interchange during encounter group therapy.

As the social masks are finally shed by all, or most members, the group can now get down to realistic exchange of feelings. The open frankness and brutal truth that characterizes the balance of the session's dialogue is what leads to the true value of the encounter experience.

From my research, it appears that the frankness and honesty that each group member eventually portrays allow the group to see and experience the true personality or psychological inner-core of each individual. The reactions of the other group members to the candidly displayed inner-self of the individual member gives the member the necessary feedback as to how others in society perceive him. He may be rebuked for his bullish tendencies, chastised for his reticence, or praised for his positive qualities. At any rate, the individual leaves a successful group encounter armed with an honest appraisal of how he affects other people, a realization of those personality traits which others find offensive, and perhaps even a renewed confidence in his capabilities to provide warmth and satisfaction to others.

The effect of marathon encounter sessions on personality was investigated recently by J. F. Guinan and M. L. Foulds./21 In formulating their study, they developed two groups of ten college students (6 male and 4 female). The authors administered the

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/19 Bach, G. R., Marathon Group Dynamics: II, Dimensions of Helpfulness: Therapeutic Aggression, Psychological Reports, June 1967, vol 20 (3-2), p. 1149.

/20 Bach, G. R., Marathon Group Dynamics: III, Disjunctive Contacts, Psychological Reports, June 1967, vol 20 (3-2), p. 1166.

/21 Guinan, J. F. and Foulds, M. L., Marathon Group: Facilitator of Personal Growth, Journal of Counseling Psychology, Mar 70, vol 17 (2), p. 145.

Personal Orientation Inventory (POI) to each group of ten students, then immediately subjected one of the groups to a weekend-long marathon session. The second group received no treatment. Following the marathon session, each group was again given the POI. The group which had attended the marathon session exhibited positive changes on all twelve scales of personality measures. Significant positive changes were shown on seven of the twelve scales. The control group, on the other hand, showed no significant variability between the two administerings of the test./22 The findings led Guinan and Foulds to conclude: "The structure of a marathon provides an excellent opportunity to observe and measure the impact of a therapeutic experience, and future studies may shed light on the process of change in those persons who are in groups and on the process of psychotherapy in general."/23

If a particular marathon group is able to achieve the level of openness and cooperation it seeks, a great deal of group cohesiveness should develop. The possibility of group rejection is often feared by participants if they reveal an embarrassing phobia or fetish. However, the groups' general drive for intragroup honesty actually serves to welcome or reinforce efforts by individuals to bring out problems which have been hidden burdens within their personality structures. The helpfulness that an individual receives from the group is genuinely appreciated. A quote from a letter written by a former marathon group member to the group leader typifies the feeling of the majority of marathon group participants concerning the helpfulness of the group co-members: "The strength that you all gave me is still very vivid in my feelings and I am also trying to soak up the idea that Margaret (the writer) is a lovable and loving person."/24

R. R. Dies and A. K. Hess sought to investigate this cohesion developed during encounter group therapy attempting to test the hypothesis that the compression and intensity present in encounter group therapy sessions heightened the degree of interpersonal relationship and led to a greater group cohesion./25 They prefaced their study with a remark that the general enthusiasm for marathon encounter group therapy had not been matched by a similar degree of empirical study regarding the psychological results of encounter on individual participants' personality traits./26 A similar observation had been made by Guinan and Foulds./27 To test their hypothesis, Dies and Hess divided male post-narcotic patients into six groups of five members each. All males had voluntarily requested psychotherapeutic treatment. Three of the six groups were subjected to one twelve hour marathon session while the other three attended twelve one hour conventional group therapy sessions. The patients were asked to complete experimental measures designed to reflect their assessment of the cohesiveness of their respective groups. Further, the first, fourth, eighth, and twelfth hours of both the conventional and marathon sessions were tape recorded by the experimenters. Ranking of the taped portions of the sessions revealed that both a higher feeling of cohesion on the part of group members and a higher verbalized manifestation of group cohesion was evident in the three groups undergoing marathon therapy. It was also shown that in both the conventional and marathon groups, but particularly in the marathon sessions, the index of cohesion increased directly with hours of

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/22 Ibid, p. 147.

/23 Ibid, p. 148.

/24 Rogers, Carl, Ibid, p. 60.

/25 Dies, R. R. and Hess, A. K., An Experimental Investigation of Cohesiveness in Marathon and Conventional Group Psychotherapy, Journal of Abnormal Psychology, vol 77 (3), p. 258.

/26 Ibid.

/27 Guinan, J. F. and Foulds, M. L., Ibid.

exposure./28

The group encounter does seem, then, to be of significant value to the participant if he enters the experience with a sincere desire to gain an enriched evaluation of his interactive capabilities. Further, he must have an open minded interest in gaining increased insight into the drives and inner motivations of others within his realm of society as typified by his group co-members. If the member is able to accept it, the brutal attacks and frank opinions he receives from his co-members serve to motivate him towards changing his accustomed behavioral traits because he receives quite candid feedback regarding the impression his interpersonal activities have on others.

Of equal importance is the fact that the individual group member, through actively participating in the group's effort to resolve difficulties of other group members, finds that he is capable of feeling for others and, in a sense, has a healing capacity which he had perhaps never used, or realized. In all, the marathon group participant will leave a successful experience with an enriched understanding of himself. He may have entered the encounter with a higher opinion of himself than he carries away, but nevertheless, he should leave with a more realistic opinion of his interactive skills and several ideas concerning how he could improve on his interpersonal relations behavior.

So far little has been said about the role of the leader or facilitator in the marathon group except to point out that he generally takes a passive role and also absorbs a substantial amount of abuse for lack of directional guidance during the early stages of most marathon sessions. In spite of his passive posture, the group leader serves several important roles in the marathon encounter. Bach cites several functions of the leader which serve to enhance the encounter experience./29 The channeling of group feedback to each member, recognition and counteraction of intimacy-preventing "games" by group members, helping the group move on to new concerns after exhausting one subject, and helping the group derive the most benefit out of emotional crises. An interesting article by Glueck describes a rather active group facilitator who provided the above impetus in a highly aggressive manner./30 He prodded group members into interaction, challenged them verbally when they were attempting to withdraw from the group, and imposed physical dynamics on the group when the free repartee declined. At first, he was heartily disliked by most group participants, but, as time wore on, he was thoroughly accepted by the group participants and even defended when he was confronted by several of his colleagues to explain the withdrawal of three clients from the encounter program. It appears then that, if the group is to be effective, the leader must be skilled at bringing individuals "out" psychologically, and must channel the group efforts towards useful intragroup dialogue, rather than permitting time-consuming digressions into current topical issues. However, he must do this subtly or the group will grow entirely too dependent on him and thereby miss a portion of the extremely valuable open exchange of ideas between group members.

Having taken a brief overview of encounter group functions, report, and benefits, a short survey will follow of the use of the encounter therapy procedures by industry.

/28 Dies, R. R., and Hess, A. K., Op. cit., p. 261.

/29 Bach, G. R., "Marathon Group Dynamics: I, Some Functions of the Professional Group Facilitator," Psychological Reports, vol 20 (3-1), p. 997.

/30 Glueck, W. F., Ibid., p. 502.

There have been a number of articles in news periodicals and management journals describing the writers' experience in encounter groups. Glueck's article mentioned earlier is a good example and was most helpful in providing a summary of the proceedings of a typical group. His group consisted larely of business men from various firms and the general attitude of the group was summed up by Glueck as follows: "It (the encounter) satisfied its objectives of better self-awareness, better understanding of the feelings of others, provided an opportunity for me to revise my attitudes and (hopefully) to attempt to modify my behavior towards others."/31

The American Management Association has shown an interest in encounter therapy. The basic thrust of the AMA's programs has been to help companies move from autocratic hierarchies to democratic organizations of effective teams./32 Reflecting the view of a number of industrial-related behavioral scientist's that money is no longer the prime motivation towards job satisfaction and higher productivity, the effort of the AMA and NTL programs has been to "make managers and consultants out of bosses as motivation now goes beyond money."/33

The application of sensitivity training in industry has met with varying results and consequently left differing impressions on industrial leaders. One of the most often read complaints is that the members of a firm, who are afforded the opportunity to attend sensitivity sessions, do not exhibit any noticeable long-term favorable effects. John F. De Santo of the Port of New York Authority feels that most of his staff members return from encounter training possessing an almost euphoric attitude with regard to interpersonal dealings, but that this objective rarely remains with the individual for a substantial length of time./34. Kurt W. Back also addresses this subject, but sees the unfortuante delusion of the attendees new lease on interpersonal relations as a reaction to the frustration brought about by the fact that an individual cannot change the whole organization./35

F. I. Steele points out a related problem, the attitude of top level management to applied behavioral science in general. He sees the sensitivity training technique as providing the manager with a better understanding of the problems around him and a realization of what hinders effective group functioning./36 He feels that the success of sensitivity training depends on managements ability to accept and live with the changed attitudes and decision processes which will emerge. Too often, top management negates the benefits of sensitivity training, and many other useful facets of applied behavioral science, for that matter, by suppressing efforts at the middle and lower management levels towards innovative change.

Much of the resistance to sensitivity training by top management centers on the following management presumptions: /37

/31 Ibid., p. 504.

/32 Business Week 10 Jan '70 No. 2106 p. 62.

/33 Ibid.

/34 Berkwitt, G. J. Ibid. p. 41.

/35 Back, K. Ibid. p. 24.

/36 Steele, F. I. "Can T-Group Training Change the Power Structure," Personnel Administration vol 33 (6) Nov/Dec 1970, p. 48.

/37 Berkwitt, op. cit.

1. Much of the material in behavioral science programs is irrelevent to business problems.

2. The effectiveness of the various problems has not been proved scientifically.

3. Sensitivity training can be dangerous if not conducted by qualified personnel.

Jerry Harvey of National Training Laboratories summarizes the difficulty in selling various applied behavioral science programs to industry in the following quote: "The toughest criteria in justifying applied behavioral science are profit, turnover, absenteeism. The easiest are also the least definitive: morale, satisfaction, a feeling of participation, and such."/38

Sensitivity training methods can be applied in industry but a successful program will have to overcome several obstacles. To begin with, the most effective encounter groups, in my opinion, should be comprised of strangers. An individual will be more likely to open-up, releasing his inner feelings and perceived inadequacies, to strangers rather than to individuals with whom he is in frequent contact. In spite of the mutual trust and confidential handling of information that should characterize an encounter group, I feel that an individual would be skeptical of revealing too much of himself to a business associate, for example, in fear that he would be placing himself at a psychological disadvantage in future dealings. Hierarchical structuring, seniority, etc., should be avoided in an encounter group, if free and open exchange is to prevail. I feel that both these requirements would be difficult to meet in an encounter program comprised of individuals from the same firm or organization.

Louis J. Schuster of the University of Missouri Faculty states that early intracompany encounter groups were not entirely successful in that only surface feelings and problems were revealed by the members.

As a result, later programs have tried a more structured approach such as problem solving sessions, or the imposition of group agenda items such as a specific discussion of various leadership styles./39 Some firms, such as ESSO, have had considerable success with encounter group methods on an intracompany basis, but the use of this vehicle was accompanied by a general top management desire for organizational change./40 I believe that this feeling must be present if the full benefits of encounter therapy are to be realized by the firm. An autocratic or strictly profit-oriented firm will not get significant value from sensitivity training because of the lack of flexibility afforded middle management, and also, the unfortunate disregard for the well-being of human resources.

In conclusion, the revitalizing effect that the majority of encounter group participants report and the clinical evidence of the effectiveness of this new type of therapy could have a favorable effect on a manager. Not only could the behavioral patterns that typify his personal life be improved, but the better understanding of himself could certainly be expected to carry over into his interaction on the job with equally favorable results. I believe that this is the real benefit of encounter therapy to industry. If a firm undertakes an internal sensitivity training program, it will no doubt force attendance by individuals who may not be well suited for the candid interchange that is required. At the least, such an individual will not be able

/38 Ibid. p. 41.

/39 Schuster, L. J. Personnel Journal vol 48 (8) Aug '69, p. 613.

/40 Johns, T. "T-Group Traumas" Personnel (London) vol. 1 (7), Jun '68, p. 41.

to take an effective role in the group, and moreover, such an experience may be damaging to him. Concerning the success of the various sensitivity therapy programs, I would recommend that top management encourage participation on the part of their employees, pay the employees entrance fee, and grant the employee the necessary time away from the job. On the other hand, I do not feel that a company should attempt to undertake such a program on its own, or even hire a qualified professional coordinator to operate the program on an intracompany basis. The company will reap greater benefits by letting its employees go through the experience on their own and hope that the improved insight and sharpening of interpersonal skills the employees will gain in the encounter experience will result in enhancement of on-the-job performance.

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_____ Business Week, Jan 10, 1970, p. 62.

_____ Monthly Laobr Review, Dec 1970, p. 19.

THE SELLING OF M I S

by J. Fraher

This article discusses the importance of a concerted effort to convince employees of the benefits to be gained from the installation of a Management Information System in an organization.

J. FRAHER, LCDR, SC, USN; B. S., 1958, U. S. Naval Academy; M.S. (Management) 1971, Naval Postgraduate School.

Term paper submitted to LCOL Smith for Management Information Systems, MN 4181.

The technological advances in management information systems realized during the past decade have not, in most instances, been greeted with open arms by the rank and file company employee. While the advantages of a dependable MIS were recognized, not all companies who wished to avail of these advantages were successful in their initial endeavors. Some companies experienced outright failure in their attempts to install meaningful management information systems and associated data processing equipment; other companies achieved only partial implementation. The overriding factor in each of these cases was management's lack of concern, or at least management's unawareness, of the effects of MIS on human relationships. Down through the ages there has been a long history of man's basic resistance to change. It should not have come as a surprise, therefore, that the advent of MIS would have been subject to an appreciable degree of resistance. To overcome this resistance, management must understand why people resist change as well as improve upon its ability to sell the advantages of MIS.

In order to remain stable and flexible and to insure long-run success, most organizations must look for changes and new ideas. Because change is highly important to the success of an organization, it is unfortunate that many people have the tendency to resist it. One of the basic reasons why this resistance occurs, regardless of whether it is in the form of apathy or outright rebellion, is because most changes disturb the equilibrium of the situation and the environment in which individuals and groups exist. To overcome this disequilibrium and to return to a state of balance requires people to go through a period of adaption and adjustment to the change. If management chooses to ignore this fundamental facet of human behavior and does nothing to help its employees prepare for this change or adjust to it, then resistance will occur. The extent of this resistance and its gravity will depend upon the nature of the people affected and the change concerned.

Although disequilibrium is the result of change and the cause of resistance, it should be recognized that the state of disequilibrium which exists is actually an imbalance in need satisfaction. An individual's needs can be classified in the following hierarchy of importance:

1. Physiological needs - the basic primary needs of food, clothing, shelter, sleep, etc.

2. Security needs - the freedom from fear of loss of economic or psychological security.

3. Social needs - the need for individual and group acceptance and a feeling of belongingness, and the desire for recognition, status, etc.

4. Self-actualization - the desire to become more and more what one is, to become everything that one is capable of becoming..../1

Prior to a change an individual exists within an environment in which, to a great degree, his needs are satisfied. When a change occurs, it represents a threat to his need satisfaction and, therefore, the individual resists the change. It is only when he recognizes that the change will not affect his need satisfaction or when he adapts himself to a change and reestablishes his equalibrium will resistance disappear. In either case, however, some degree of adjustment will occur.

The types and kinds of changes that cause disequilibrium and resistance are legion in number. Whether such changes are the result of technological advancement or managerial efficiency makes little difference - a threat to security, status, and other basic needs has occurred. Consequently, even if the change is potentially beneficial to the employee, resistance usually results. It should come as no surprise to management, therefore, that employees would envision an automated management information system as a threat to their security within the organization. Behind the hostility to an innovation which will threaten the security of any employee is fear. Fear of losing his job,being displaced, demoted, loss of prestige, loss of earnings, etc. are all examples of the day-to-day fears or anxieties experienced by the young or old employee who is subject to change.

It should be realized that the average rank-and-file employee in industry today, unlike his counterpart of fifty years ago, is much more economically dependent upon his job tenure. He does not possess the craftsmanship or skill which was in such great demand fifty years ago. Consequently, the employee who has spent ten to twenty years in a particular line of work has gained little that is considered saleable. It is because of this that there exists such a feeling of need for some form of job security among most working people (whether it be seniority or some other form of property rights in the job). It is not difficult to realize, therefore, why anything that threatens job security or hardwon status, such as it is, is desperately feared and resisted.

Resistance to change can take many forms. "At one extreme, people suffer a temporary disequilibrium in need satisfaction, ask a few questions about the change, quickly adjust to it, and resume their previous behavior. At the other extreme, reaction can take the form of open opposition, rebellion, and even destruction."/2 In

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/1 A. H. Maslow, Motivation and Personality (New York: Harper & Brothers, 1954), p. 91.

/2 I. L. Heckman, Jr. and S. G. Huneryager, Human Relations in Management (Cincinnati, Ohio: South-Western Publishing Co., 1960), p. 425.

between these extremes are many other forms of behavior, such as apathy, indifference, and antagonism. Whatever general form resistance to change may take, it is important for managers to recognize that human behavior will always be influenced by it. This means that immediately or ultimately the change will exert an impact on employee performance. Depending upon the nature of the resistance, therefore, behavior can be reflected in such things as quantity and quality of product, absenteeism, tardiness, turnover, grievances, accidents, and even outright strikes. It is imperative, therefore, that management make every effort possible to effectuate the change properly and to facilitate adjustment to it.

Before management can initiate corrective measures to prevent and overcome resistance to change, management must first respect and understand employee reaction to change. "Altogether too frequently, people in leadership positions assume that because a change will definitely be beneficial to people, it will be acceptable to them."/3 Actually, nothing could be further from the truth. Consequently, whether threats to need satisfaction are real or imagined, they must always be recognized as powerful motivators of behavior. As such, some manner or norm of adjustment facilitation must take place. Another important point to understand is that there is no one simple panacea for preventing or overcoming resistance to change. In most situations management will be required to utilize many methods, techniques, and procedures to overcome the resistance to the implementation of an automated management information system.

Resistance to change will not prevail among the rank-and-file members of the organization only, it will also exist among the foremen or middle managers. Foremen will see the implementation of MIS as a challenge to their position within the organization; fear is not the sole property of the lower-level employee. Perhaps what foremen fear most is their inability to conform to required changes, to learn the new system and procedures dictated by a management information system. The majority of foremen have given over twenty years of service to the organization, are in middle age, and to a great extent are "set in their ways." They have become accustomed to making the majority of the decisions which affect their sub-organization, and with their position has come a certain degree of prestige and responsibility. The majority of the foremen view the introduction of MIS as a challenge to their job and the possible elimination of several of their positions within the organization. This feeling prevails particularly in those industries where the functions of the foremen are highly repetitive in nature and can easily be computer programmed. Few of the foremen view the implementation of MIS as a management tool to be used to their advantage. They do not accept the theory that MIS will provide them with up-to-date information which will help them in their decisionmaking processes and consequently make more time available for performing other important duties. Few foremen are willing to recognize the advantages of MIS as did Peter Drucker, who stated that "...the computer is restructuring these jobs, enabling us to organize work where it logically belongs, and to free middle managers for more important duties."/4 Foremen, in general, who resist change see it as a challenge to the privileges, prestige, status, and authority which they now enjoy and as a threat to their security. Few have the foresight to see it in the eyes of Peter Drucker. So when we speak of resistance to change, we should not envision it as resistance on the part of the rank-and-file employee only, but also the resistance to be expected from foremen and/or middle managers.

In ignoring the human factors involved, the implementation of a management information system can have far-reaching consequences. Failure to secure employee support

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/3 I. L. Heckman, Jr. and S. G. Huneryager, Human Relations in Management (Cincinnati, Ohio: South-Western Publishing Co., 1960), p. 474.

/4 Donald K. Sanders, "Computers, Organization and Managers: Some Questions and Speculations," SAM Advanced Management Journal, (July 1969), p. 78.

has resulted in the failure of management systems in several companies. Employee support alone will not solve all the inherent problems of an MIS. However, management can not overcome other problems without it. It may seem surprising that foremen and middle managers have to be won over. As loyal company employees, it should actually be expected that they would be in favor of any change that would appear to be in the company's good. Human nature being what it is, people may say that they welcome progress. However, they will not actively support it unless it means personal progress, those affected by the change will fight it in every way, overtly or covertly.

Employee resentment, like fear, is easy to trace and understand. It is a trait of human nature to resent what is not completely understood if it represents a potential danger. It is not difficult to understand, therefore, why employees will resent and fear an MIS in the company. Most people think that computers and their associated systems are synonymous with mass unemployment. The rank-and-file employee will look at the computer as a threat to his job; the foreman will fear for his position and status. If top management does nothing to allay these fears and suspicions, then it can be expected that either morale will ebb until an individual cannot do his work or he will begin to fight back, actively or passively.

There is a distinction between making an organizational change and managing an organizational change. While both psychological evidence and practical experience confirm the fact that employees will resist change, it is equally true that people may also react favorably to change if they understand what the change is all about and are prepared for it in advance. Basically, employees prefer to stay with the status quo, for in the existing setting they feel stable, secure, and comfortable. They have established their equilibrium within the realms of the status quo and resent any outside influence which will disrupt their equilibrium. If management is to disrupt this equilibrium and overcome the anticipated resistance to a management information system, it must call upon all the available "selling" expertise of its top managers. Top management must sell first to middle management and then to rank-and-file members the fact that a need exists for a meaningful MIS and, secondly, that the needs of the individual are recognized and will be respected. This selling project must be initiated before any attempt is made in introducing a MIS. It must continue during the implementation stage and should not be culminated before management is satisfied that the MIS is operating efficiently and resistance to it has been completely overcome.

Sound management is characterized by readiness and ability to effect an orderly transition when a change is indicated. Naturally, the decision to make a change of major proportions should be based on real and compelling reasons. It should definitely not be just to further the personal interests of business bureaucrats, or for any reason other than to improve overall business performance. There is a tendency in some companies to make unnecessary changes too frequently. The work force of such an organization is sensitive to these situations and they understandably conclude that changes are being made on the basis of whim and personal inclination, rather than as a result of study and deliberation. Top management endeavoring to sell an innovative MIS in such an organization can expect to face strong resistance.

The management team burdened with the responsibility of selling MIS to the company's employees should have a thorough understanding of the company's formal and informal organizations - and the ability to integrate the two as much as possible. Cliques and alliances within the company often take a position, pro or con, in regard to proposed changes. Here the effectiveness of the manager is put to the test, for his own attitude and his capacity for discussion, criticism, communication, and consultation are vital in modifying the stand of groups that are opposed to the change and in winning acceptance for the plan. Chester Barnard, in his book, The Functions of the Executive,

provides a detailed analysis of the role of the manager in formal and informal organizations.

Once top management has decided to introduce a management information system, its selling approach should be conducted along two fronts: the logical and the psychological. The logical approach is usually more obvious than the psychological, and that is why the psychological is so often overlooked, with adverse effects. Human relations are often jeopardized, not because of the change itself, but because the people involved feel that they are being maneuvered, manipulated, or pressured into the change. People also often feel that they have no opportunity to express their doubts or feelings about whether the change really represents an improvement. Additionally, since they feel that their security is being threatened, or because the social relationships of the work group are being disturbed or dislocated, etc., adds to their feeling of unrest and builds resistance to change. It is vital, then, that the psychological factors involved in change be given as much attention as the logical factors if the change is to be satisfactorily effected. The psychological and logical approaches to the problem cannot be attacked as two separate problems to be overcome. They are not separate sequences as there is a definite amount of interfacing between the two approaches and the management team selling the change must be aware of this interplay and exploit it wisely as they proceed.

If top management is to approach the overall problem of implementing a management information system and, concurrently, overcoming the resistance to it in a logical manner, it is imperative that the team understand in detail the reason for this change. The team must understand the company's philosophy, goals, and objectives and how the proposed MIS will affect them. The team must be familiar with the present operating procedures and how MIS will contribute or detract from these procedures. The team must be satisfied in their own minds that the required changes cannot be effected without the aid of MIS. In other words, there should not exist a simpler or less disruptive system available which would produce the same required results. Once top management is satisfied that a total MIS is the route to follow, then the brainpower of both line and staff people should be tapped. Union representatives should also be informed of the proposed changes and kept informed as the project progresses. The logical approach would also dictate that this homogeneous team should be responsible for the implementation of the MIS and for educating and training the other managerial and nonmanagerial personnel who would be affected by the new system. The implementation team should also make the necessary adjustments to job descriptions, work requirements, personnel positions, standards of performance, etc. Additionally, the responsibilities of those affiliated with the new MIS should be clearly established.

In addition to this logical approach, and simultaneous with it, management should also be following the psychological approach. The goal of the psychological approach should be to attain acceptance of the MIS with a minimum of resistance. One of the first steps taken should be to disseminate advance word to all concerned that the company is contemplating installing MIS, a change that will affect them. The shock of unannounced change can seriously affect morale; if the word does not get out officially, it is bound to get out via the grapevine. The psychological team should make every effort to gain acceptance of the fact that MIS will be of benefit to the company and the employee. Perhaps it can be shown that competitors have installed such a system and are enjoying benefits from it. Those personnel who will become involved and actually participate in the overall project should be designated in the early stages of the change. The more people who can participate, the more assured of success the project will be. The real leaders of the various informal organizations within the company should be known and the proposed MIS should be sold to their groups via the leader. At the initial meeting during which the management information system is presented, the presentation should be made by a member of top management generally acceptable to the rank-and-file employee. Selection of the wrong person can create resistance to the

project before it is even ready to get off the planning stage. The project is identified with the speaker and any antagonism towards him will make the idea unacceptable to the listeners. Many organizations have learned to their dismay that a management information system cannot be effectively implemented in a short period of time. Sufficient time must be allowed not only for the implementation phase but also for adjustments - organizational, technical, and human. "It takes time to develop new skills, depart from old habits and settings, establish new relationships or even to reorient oneself to familiar situations with a new twist."/5

It is important that employees realize what types of jobs will be eliminated. MIS, in general, will eliminate repetitive, monotonous, and primarily clerical jobs that normally show a high turnover rate. It should not be difficult, therefore, for the management planning group to insure that all personnel reductions are realized through attrition. To further allay the fears of the organization's employees and to enhance the success of MIS, a training program should be initiated to train employees for the new, higher-paying positions.

During the implementation phase of the MIS, employees should be kept informed of progress via special reports, lectures, organization newspapers, etc. Any additional employees hired during the implementation phase should be designated temporary help unless they are technical personnel considered necessary for the successful operation of the MIS. Following the implementation of the computer equipment, all employees would be taken in groups on conducted tours of the computer installation. Additionally, employees should be shown motion pictures on MIS, in general, and pictorial displays of the organization's specific system. These tours should be conducted by senior managers of the new systems department in an effort to maintain employee support by providing as much information as possible on the system, the method of operation, and the benefits to be derived by the employees and the organization.

It is an old adage that "there is no substitute for teamwork." No one will tend to oppose the program if he is part of it. Active participation in planning the system is an effective means of winning the support of department heads and their assistants. The question of participation is a critical part of the overall program of winning the support of employees. The matter should be given careful consideration with one overriding guiding principle: The planning group should be of manageable size and made up of interested and competent personnel with the widest possible departmental representation, with preference to the departments that will be affected by the MIS installation.

The entire program of selling MIS and winning personnel support for it can be a rewarding one. It can create an "esprit de corps" in the company. If properly planned and implemented, both the employer and the employee can reap long-range benefits from a meaningful management information system. Each employee will have a more interesting and rewarding job as a result of the information system. And the increased effectiveness of each employee will result in a better and more profitable company, with a decided advantage over its competitors.

/5 Nathaniel Stewart, "Are They Ready for Change?", Management Review (October 1961), p. 6.

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REALISTIC DETERRENCE -

THE NAVY'S EXPANDING CHALLENGE

by W. F. Fernow

This article chronicles the evolution of various nuclear strategies from the first employment of nuclear weapons in World War II to the present. The author predicts an expanding role for the Navy in nuclear deterrence in the 1970's and 1980's.

W. F. FERNOW, LCDR, USN, B.S. U.S. Naval Academy 1959; M.S. (Management), Naval Postgraduate School 1971.

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Introduction

The continued peaceful existence of a nation amid the complexities of the modern world is a matter that challenges the intellect of man. The national security policy of a democratic country is an amalgamation of diverse considerations. The moral and economic considerations operate through the existing political structure in determining the direction of policy. The portion of this policy that involves military forces as an instrument of national security is a facinating study. It is the responsibility of the military forces to carry out their assigned tasks within the bounds of monetary and technological constraints. While remaining both responsive and responsible to the control of the policy makers, military men must turn plans into the reality of action. The U. S. Navy has maintained a major role in this constantly changing milieu of national security. It is the purpose of this paper to concentrate only on the evolving policy of strategic deterrence, ignoring much of the moral, economic, and political forces to which it owes its genesis. To create an understanding of the present and prognosticate the future, it will be necessary to dwell all too briefly on historical background. The managers of the Navy should not hesitate to take a parochial view of their functions, particularly in hopes of achieving greater efficiency in the management of resources.

Historical Development of Deterrent Strategy

The United States found itself at the end of World War II in the position of having exclusive possession of the most formidable machine of war yet devised - the atomic bomb. Several other significant situations persisted at that time: The U. S. was the predominant sea power and had the predominant productive power; Russia was the predominant land power in Europe and Asia. The initial direction of U. S. policy

was toward the establishment of peaceful means of maintaining world order: i.e., the founding of the United Nations. The continuing development of strategic weapons and delivery systems progressed in a low-key, splintered manner for several years. A strengthening of purpose was caused by a succession of events that began in 1948 with the Russian blockade of Berlin. This test of the allies' resolve was closely followed by the explosion of the first Russian nuclear device in 1949. The Korean War brought with it the realization of the need for conventional forces to fight limited wars and illuminated the reluctance to use nuclear tactical weapons. The failure of this conflict to expand into general war persuaded some that it was the presence of the nuclear deterrent that kept it within bounds. Whatever the reasons, a precedent of non-use had been established and destined to be repeated in Southeast Asia several years later.

Massive Retaliation

The Eisenhower administration, devoted to ending the Korean War and reducing defense expenditures, assumed the reins of government in 1953. The evolving policy of national security encompassed a reliance on deterrent power with a concomitant reluctance to become involved in land wars, particularly in Asia. This "Massive Retaliation" doctrine was paralleled by the awareness that the Russian capability in weaponry was approaching that of the United States. Russia had trailed the U. S. by four years on the explosion of a nuclear device, but only by eight months in the testing of a thermonuclear one. The pursuance of the doctrine of massive retaliation resulted in the development of intermediate range ballistic missiles by the Air Force (Thor) and the Army (Jupiter) and their subsequent deployment to Europe under Air Force control in the late 1950's. The latter part of that decade also saw the early work on research for the follow-on system for the still developing Atlas program, the Titan Intercontinental Ballistic Missile (ICBM). Development work was begun for a reconnaissance satellite. Two dramatic events occurred in 1957 that generated considerable reaction in the United States: the announcement by the Russians of the successful testing of an ICBM and the launching of the "Sputnik" satellite.

Another significant achievement of this era was the development of solid missile fuel, which permitted taking advantage of the advances being made in miniaturization of electronic components and warhead design. This progress culminated in the evolution of the Air Force Minuteman and Navy Polaris missile systems.

The Eisenhower programs led to a remarkable advancement in massive retaliation capabilities, but the severe budget restraints of the period resulted in the downgrading of conventional warfare capabilities such as tactical air forces and non-strategic missiles. The widespread U. S. reaction to the perceived Russian "threat" produced potent political issues such as the "missile gap" controversy (which was subsequently disproved).

Assured Destruction

The Kennedy-Johnson administrations recognized the weaknesses that had been engendered by the emphasis on massive retaliation. The conventional forces received additional emphasis and budgets increased accordingly. The strategic force buildup leveled off and the policy of flexible response became the doctrine for responding to the need for limited warfare. This policy was instrumental in the successful resolution of the Russian missile buildup in Cuba, but can also be credited for the involvement in the Vietnam situation. The Minuteman and Polaris forces assumed larger strategic roles and the Air Force strategic bomber forces remained at a somewhat constant level. President Kennedy and his advisors were undoubtedly influenced by a book published by Bernard Brodie in 1959 that was comprehensive statement of the need for the development of a range of responses./1

/1 Bernard Brodie, Strategy in the Missile Age (Princeton, New Jersey: Princeton University Press, 1959)

The Nixon Doctrine - Realistic Deterrence

With the advent of the Nixon administrtion, it became clear that the forces of change had again created the need for a readjustment of national security policy. Internal domestic problems combined with the moral arousal and changing mood of the nation to force a restructuring of national priorities. The graduated withdrawal from an unpopular war in Indochina was providing the possibilities of channeling money and forces into more productive applications for the nation. In 1968 the Brookings Institution published a study that was collection of essays on some of the urgent issues that would confront the new administration./2 Two articles are of particular interest for our purposes. First the article by Henry Kissinger on the central issues of foreign policy provides great insight into the development of policy since his assumption of an irfluential role in government./3 Second, the essay by Carl Kaysen surveys the area of military strategy, military forces and arms control./4 Dr. Kaysen analyzes the economic aspects of a continuing policy of military "superiority" vis-a-vis the Russians. The extreme costs encountered in the development of weapons systems that are required to maintain a measure of strategic superiority provide the motivating force for finding some common ground of agreement on arms limitations.

The Nixon doctrine is an attempt at integrating as many aspects of foreign policy with military strategy as possible. The key aspects of this doctrine are: (1) requiring our allies to assume a greater share of the burden of mutual defense, particularly where supplying of manpower for defense in involved, (2) increased military and economic aid to friendly countries, (3) the continued strategic role of the United States in providing a "nuclear shield" for the Free World.

Strategic Deterrence in the 1970's

The spectre of an multinational nuclear club has grown fitfully and has been shrouded in secrecy. What had started after World War II as a Russia/United States exclusive struggle has nowexpanded to include England, France, and mainland China. Even though the "Super Powers" remain the principle actors in the play, the parts of the secondary players cannot be ignored.

The Russians have concentrated on developing a first strike capability. The use of large yield ICBM's to provide the "threat" of destruction has proven to be effective. The United States, while possessing the capability to launch a first strike, espoused a policy of restraining its forces to the role of only responding to an enemy attack. While the Russians have been able to feel relatively secure in the knowledge that no U. S. President would initiate a first strike under any plausible set of circumstances, the U. S. had no such confidence.

The last two decades have been replete with move and countermove between the two major powers. Policies have been motivated by fear of what might be, rather than certain knowledge of what is. The escalating nature of nuclear weapon development and deployment has galloped headlong through the postwar period. The United States throughout this period has tended to over-exagerate the Soviet's first strike capability and has attempted to maintain its nuclear "superiority."/5 Even the term "superiority" has been outmoded by the times. There can be no superiority in the nuclear age. The consequences of use of the available weapons gives us the basis for defining "parity" as a more useable term. Both the United States and Russia possess sufficient nuclear strength to survive an initial strike and still provide an assured second strike to destroy the enemy's ability, or will, to continue in any conflict.

/2 Kermit Gordon, ed., Agenda for the Nation (Wahsington, D.C.: The Brookings Institution, 1968)

/3 Ibid., pp. 585-614.

/4 Ibid., pp.549-584.

/5 Bernard Brodie, ed., The Future of Deterrence in the U. S. Strategy. A study prepared for the United States Air Force by the Security Studies Project of the University of California, Los Angeles. 1968, pp. 20-21.

The technology of advanced weapon design and construction has raced ahead, far outstripping any coherent policy concerning the implications of their employment. We are reaching the point where the economic costs of providing counterforces are overburdening. It is also reasonable to assume that the Russians are encountering similar constraints. Although our political system makes our government more susceptible to popular opinion and internal problems, the Russians do not possess the industrial or economic capacity for some of the costly weapons developments that are probable in the near future.

Present Balance

In the past two years the Soviets have been engaged in an expansion of both their first strike and counterforce capabilities. The deployment of Submarine-Launched Ballistic Missiles (SLBM) similar to the U. S. Polaris/Poseidon missile has evoked a startling awareness of the relative parity between the two nations. The Secretary of Defense has released figures comparing the relative strengths in mid-1971. These figures show that the Russians enjoy a numerical superiority in land-launched ICBM's of 1,500 to about 1,000. The U. S. leads in submarine-launched missiles by 656 to 400 (with Russia in a high building period) and in long-range bombers by 650 to 150./6 While the Soviets have developed larger warheads, the U. S. has concentrated in smaller warheads with greater delivery accuracy to achieve a similar measure of destructive potential.

The United States has maintained a technological advantage in the deployment of MIRV's (Multiple Independently Targetable Reentry Vehicles). These were first deployed in the spring of 1971 on a Poseidon equipped submarine./7 The MIRV capability is also being deployed in the Minuteman III missile.

Thus, it can be seen that both of the major powers are using the concept of the "triad" of weapons delivery systems (land-based missiles, submarine-based missiles, and long-range bombers), although in differing mistures. It is not conceivable that one adversary would be capable of destroying all three methods of retaliation of the other. Therefore, the means for delivering a second-strike is almost assured to each of the adversaries. The technological and economic capacities for providing adequate defense against each method of delivery is not likely to develop within the next decade.

A Credible Deterrent

The possibility of establishing a "credible deterrent" is a difficult matter in the modern situation. In order to establish such a deterrent a major power must consider the following requisite conditions:

1. The ability to mount a counter attack against the other major power in the case of direct confrontation.
2. The ability to deal with a lesser nuclear power that possesses the ability to reduce one country's capacity to retaliate against its major opponent, thus upsetting the existing balance.
3. The ability to deal with non-nuclear powers in such a manner as to prevent the possibility of escalation into a nuclear exchange between major powers./8

/6 William Beecher, "Experts See Soviet and U. S. Nuclear Arsenal in Rough Balance," New York Times, May 21, 1971, p. 2.

/7 George Weiss, "Strategic Deterrence: Rationale, Negotiations, Threat, and Status," Armed Forces Journal, 7 June 1971, p. 25.

/8 Arthur Lee Burns, Ethics and Deterrence, Adelphi Papers Number 69. (London: The Institute for Strategic Studies, 1970).

It is exactly in this respect that President Nixon has formulated the doctrine of "Realistic Deterrence."

Strategic Arms Limitation Talks (SALT)

The fact that the Soviet Union has been participating actively in talks concerning the limiting of strategic arms indicates that the Russian attitude is changing. Some observers are optimistic concerning the likelihood of achieving relative stability, at least at the nuclear weapons level, in the adversary relationship of the United States and Russia./9 The evidence of an emerging "modernistic" Soviet view of foreign policy is further substantiated by the announcement of agreement to concentrate the SALT discussions for this year on the limiting of anti-missile defenses and the limiting of the number of some offensive weapons./10

The SALT talks hold significant implications for the 1970's. It is likely that agreements reached in the near future will dictate the numerical level of deployed weapons. The agreements reached will probably restrict the deployment of anti-ballistic missile (AB) systems to a "thin" system for each power. The likelihood of development of a satisfactory "thick" ABM is extremely small in view of the cost and the fact that neither country currently has the requisite technology to develop anti-MIRV capability. It is this MIRV capability of the U. S. missiles that will best deter the Soviets from developing a thick ABM due to the cost-ineffectiveness of such a system./11 The next most probable development will be some means of restricting the number of deployed missiles without specifying their particular capabilities, such as MIRV. The possibility of agreement in this area appears unlikely, since it is essentially an unenforceable condition without inspections. This limitation in number, but not capability, will encourage continued technical "improvement" in complexity. The result will be the sustenance of destructive parity. Of more long-range concern will be the restraint of the development of increasingly terrible concepts such as space-based or satellite weapons systems, microbiological, or geophysical warfare./12 The attention of this paper will be directed to the decade of the 1970's and the implications for the Navy.

Why a Thin ABM?

The thin ABM fits into the scheme of both the triad of weapons delivery systems and the ability to deal with the minor nuclear powers (notably China). Malcolm W. Hoag has summarized the advantages of a thin ABM as follows: (1) the hard-point protection of missile silos, (2) the denial of high-confidence to either side that it could launch "light" nuclear attacks upon the other's homeland in response, say, to the use of nuclear weapons in European conflicts, and thus, the reinforcement of deterrence against any such light attack, (3) protection against any small accidental attack, and (4) for any would-be nuclear power that aspires to retaliatory capabilities against one or both of the superpowers, raising the price tag for such capabilities to high, and perhaps prohibitive levels./13

/9 Lawrence T. Caldwell, Soviet Attitudes to SALT, Adelphi Papers Number 75 (London: The Institute for Strategic Studies, 1972), p. 21.

/10 Max Frankel, "U.S. and Russians to Stress ABM's at Arms Parley," New York Times, May 21, 1971, p. 1.

/11 Malcolm W. Hoag, Statement on the Military Budget and National Economic Priorities (Santa Monica, California: Rand Corporation (P-4107) 1969, p. 5.

/12 Nigel Calder, ed., Unless Peace Comes, A Scientific Forecast of New Weapons (New York: The Viking Press, 1968), pp. 231-243.

/13 Malcolm W. Hoag, What New Look in Defense? (Santa Monica,=California: Rand Corporation (P-4048-1), 1969, pp. 21-22.

The Role of the Navy in the 1970's

It is virtually certain that the United States will continue with the triad concept throughout the 1970's. However, there are several factors that indicate that there will be an increase in the magnitude of the role of the Navy. The Air Force fleet of long-range bombers is aging. The technology necessary to counteract a bomber attack is within economic feasibility. The development of a follow-on bomber (the B-1) has been fitful and, even with an increased funding request, will not fly before 1974.

The Minuteman will continue to be the land-based missile backbone, upgraded with MIRV capability. However, the cost of providing protection against missile attack is prohibitive and not at hand technologically. Public reaction is against increased funding of ABM for site protection. The feasibility and cost of mobile Minuteman deployment makes it an unlikely alternative to ABM./14 There is an increase in public pressure to remove missiles from mainland sites in order to decrease the danger to the public either from incoming attacks on missile sites or from the fallout from anti-missiles.

Thus, while retaining the triad, the United States will most likely increase the proportional number of sea-based missiles. This will satisfy most of the current limiting criteria for strategic deterrent weapons systems. It is relatively immune from detection in the deployed condition, hence, the ballistic missile submarine has good survivability (at least in the present state of technology). The distance from the mainland provides the population a measure of protection in case of attack on the submarine.

The current sea-based missile arsenal consists of 41 Fleet Ballistic Missile Submarines, of which 31 will eventually be equipped with the new Poseidon missile. This missile is the follow-up to the Polaris family of missiles of the past ten years. With MIRV equipped warheads, the Poseidon missile represents a significant increase in capabilities./15

The Next Generation - ULMS

The immense logic of a sea-based deterrent is gaining popularity among both defense planners and members of Congress./16 The principal limitation of the Polaris/Poseidon system has been the range of the missile. The current A-3 Polaris range is about 2,500 miles. Although Poseidon has far greater accuracy and penetrability, its range is only slightly greater than Polaris.

The President has requested 110 million dollars in the 1972 Fiscal Year budget to fund the continuing research on the proposed Underwater Long-range Missile System (ULMS)./17 With a potential deployment date late in the 1970's, ULMS could assume a vital role in the 1980's. The ULMS will provide the submarine with a mid-ocean operating area, greatly reducing the possibility of counter action. This greater operating area also makes the defensive problem more complicated as it increases the width of the sector from which an attack may originate.

The ULMS submarine will be larger than today's variety due to a larger missile and an expected greater number of missiles to be carried. This larger submarine may require new handling facilities with deep draft channels. This will be offset by a decrease in reliance on overseas replenishment sites.

The size of the ULMS fleet will be smaller than the present Polaris/Poseidon fleet, with most estimates at about 25./18 The cost of the new program is currently

/14 Joseph Volz, "Mobile Minuteman Labeled Wild Scheme" Armed Forces Journal 20 June 1970, p. 14.

/15 Frank Leary, "ULMS: Will all the Targets Go to Sea?", Armed Forces Management, May 1970, p. 38.

/16 "Sea Hawks Opt for ULMS," Armed Forces Journal, 16 May 1970, pp. 10-11.

/17 U.S. Secretary of Defense, 1972-1976 Defense Program and the F.Y. 1972 Defense Budget"

/18 Leary, op. cit., pp. 39-40.

estimated at about 15 billion dollars, with the pessimists guessing at 25 billion./19 If speculation concerning a possible SALT agreement in the future limiting the number of missiles proves true, it would appear that future plans would be to gradually retire the Polaris/Poseidon fleet. The first to go would be the ten submarines that are not scheduled to be converted to Poseidon. Important decisions beyond this year's funding for ULMS will probably await the outcome of the current round of SALT.

The Chief of Naval Operations announced at a recent press conference that an alternative sea-based missile program was under consideration./20 Dubbed EXPO, it is an extended Poseidon Missile that would fit into the existing submarines. As yet unfunded, EXPO is very much in the speculative stage. Since it offers a possible alternative to ULMS at much smaller cost, it is sure to attract much attention and controversy./21

What Must Be Done to Meet the Challenge?

Most of the improvements and new developments in equipment necessary to meet the requirements of ULMS appear to be well within the technological capability of the research scientist. Among the improvements are: improved missile propulsion for the longer range within shipboard size constraints, improved ship navigational accuracy consistent with the system requirements, improved missile accuracy, and increased reactor core lifetime to provide longer time between overhauls (to obtain more time on station). An orderly, properly funded program, adequately managed in the tradition of the Polaris program, should provide the expected capabilities.

However, some of the more mundane matters must receive the attention of the systems planners. False economy must not cause the slighting of the support area for the submarines. As the time between overhauls increases beyond the already considerable five years, much serious attention must be paid to traditional engineering matters. The present submarine is experiencing an excessive amount of trouble from equipment that has not received proper attention during development work. Examples of this are: sea valve operation and sea water piping material, high pressure air piping, electrical insulation and air conditioning. Although intermediate level maintenance is exceptional today in the Polaris force, it will have to be even better in the ULMS force. This will not come easily or cheaply.

Finally, the most pervasive, perplexing problem of the future submarine force is the retention of the necessary, motivated, qualified personnel. An excellent commentary on the current crisis in personnel retention within the submarine force during the years since the advent of nuclear power was recently published in the United States Naval Institute Proceedings./22 The significance of this problem will be magnified by the drive for a "volunteer armed forces." We should not consider that the nature of the problem is new. The Personnel Research Division of the Bureau of Naval Personnel sponsored an investigation into the anticipated problems of the operations of FBM submarines in 1958, prior to the first patrol. Two of the several areas studied are particularly interesting. These two areas are habitability and motivation. While the former proved to be merely troublesome on occasion, the latter has proven to be insidious. The portions of the motivation problem that the investigators forecast to be serious were sensory (or activity) deprivation, the role of leadership, particularly by the Commanding Officer, knowledge of one's situation, and identification with one's unit./23 The advances of technology have far outstripped our ability to understand what motivates a person to want to do a certain job. The Navy must look again at the management of the personnel resources, insuring that the problem of personnel motivation receives at least as much attention as the technology that is placing ever greater demands on people.

/19 "ULMS: Another Answer?," Armed Forces Journal, 20 June 1970, p. 18.

A /20 National Journal, September 4, 1971, p. 1360.

/21 James D. Hessman and Benjamin F. Schemmer, " 'Expanded Poseidon' Clouds ULMS Picture", Armed Forces Journal, August 1971, pp. 16-17.

/22 Captain Tom B. Thamm, U. S. Navy, "The Quiet Crisis in the Silent Service" United States Naval Institute Proceedings, August 1971, pp. 50-58.

/23 A. S. Levine, "Major Problem Areas in Personnel Management" and "Hab itability and Motivation as Related to the Polaris Submarine," Polaris Personnel Research Memorandum, U. S. Bureau of Naval Personnel, 10 February and 31 December, 1958.

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