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The Volunteer Military and the Rest of the Iceberg*

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ABSTRACT

Most discussions of the volunteer military have concentrated upon either the social costs of conscription or the level of entry pay needed to attract sufficient numbers of volunteers. These studies have neglected the impact of movement toward a volunteer military on the management of the military force as a whole. The central theme of this paper is that many of the largest personnel problems are exacerbated, if not caused by, the incentive system. Many of these incentives—incorporated in the pay and retirement structure and the training and utilization patterns for personnel—were developed for historic reasons that are no longer applicable. With the introduction of a volunteer military, mistakes in the personnel system become more costly. Adjustment of the most perverse incentives could lead to a self-correction of many glaring problems.

The movement to a volunteer military represented a dramatic change in the operation of the military. The previous system of conscription was inequitable and inefficient. And, by tying onto the sentiments evoked by the Vietnam War, it was possible to change military recruitment so that peacetime operations of the military were more closely linked to social costs through competition for personnel.

Almost all analyses of the volunteer military proposal focused on the cost of obtaining sufficient numbers of entrants into the military.¹ However, while the issues of the cost and composition of entering volunteers are important, the implications

* This paper is an expanded version of a paper written with William W. Hogan, "Implications of Paying for What You Get," which was presented at the Second Interservice Defense Policy Conference U.S. Air Force Academy, March 1973. That paper, written while we were both in the Air Force and members of the Air Force Academy faculty, led to our dismissal from the faculty and a subsequent year and a half period of truly bizarre occurrences while we were still in the Air Force. A partial account of the history behind this paper can be found in Seymour M. Hersh, "Two Ousted Teachers Say Air Force Stifles Academic Freedom," *The New York Times*, July 16, 1974.

Besides the important inputs to this analysis by William Hogan, this paper also benefitted from helpful comments and data supplied by James Marlin, Jr. Any deficiencies remain my responsibility, however.

¹ The analysis of the volunteer military that went into the decision is well represented by Thomas S. Gates et al., *The Report of the President's Commission on an All-Volunteer Armed Force* (Washington: Government Printing Office, 1970).

of the volunteer military for the management and efficiency of the Armed Forces as a whole are perhaps more important. In particular, the management of the incentives used to control personnel utilization patterns or to assure the existence and selection of desirable career profiles assumes a critical importance in an all-volunteer environment. The incentives which affect the operation and structure of the whole force are the focus of this paper.

For the present discussion, management is defined quite narrowly as providing incentives which tend to adjust the force (volunteer or otherwise) in desirable ways. Further, desirable adjustments in the force are defined as ones which provide the current capabilities at reduced costs. The major thesis is that over the years many important incentives have evolved in such a way that they currently induce people to operate in ways which are counterproductive for the force as a whole. In many cases these incentives may be counterbalanced by other forces, but the military can take little credit for such fortuitous circumstances. The point remains that many incentives which are directly controllable are structured at cross purposes to efficient management interests.

Writers discussing the volunteer military have occasionally made fleeting reference to the possibility that the volunteer military might lead to more efficient operation of the entire military. The underlying notion is that the volunteer military would necessarily lead to the military's paying the full social cost for labor and that that would lead to better utilization of people. The point that this neglects is the historical structure of personnel incentives that tends to inhibit effective personnel management. In fact, a direct effect of the volunteer military is to make previous inefficiency much more expensive. Further, the volunteer military appears to have exacerbated the military personnel situation because it has led to a series of short-run reactions to budgetary pressures that have undesirable long-run implications.

The first section of this paper details the most serious problems with personnel incentives. The second section suggests a series of alternative policies designed to promote efficiency in military operations.

Throughout the paper, the central focus is management of the officer force. Many of the issues seem transferable to the enlisted force; however, historically the management of enlisted personnel appears far superior to the management of the officer force. One hypothesis is that decision making is more rational when the decisions do not directly affect the decision makers. This is borne out in the management of enlisted personnel in all services. It is also borne out in the management of different segments of the officer corps across services; the Air Force, for example, appears to do much worse at managing pilots than do the other services.

The Economics of "Humps"

The operation of the military personnel system in peacetime has always included a curious mixture of pragmatic, short-run patches to the basic personnel plan and analyses which try to explain and rationalize continuing anomalies in the force structure. The most pervasive feature of the military personnel structure is the existence of "humps" in the force profile; that is, bulges in particular rank and age cohorts which

represent deviations from the desired mix of personnel. During the 1960s, the focus of attention was on the Korean War hump, a condition of having considerably more senior officers than desired. The Korean War hump had followed the World War II hump. And, just as the Korean War hump was about to disappear because of aging, the Vietnam War hump began to emerge.

These aberrations in the force profile become matters of serious concern to the military because Congress has placed restrictions on the numbers of senior officers. Thus, for a number of years the Department of Defense has returned to Congress to seek temporary grade relief—temporary authorization to exceed the limits in the grades of major, lieutenant colonel, and colonel. However, underlying these humps are a set of incentives and management decisions which imply that such aberrations may not be temporary but indeed may always be present as long as there are shifts in total force size such as those which result from wartime situations.

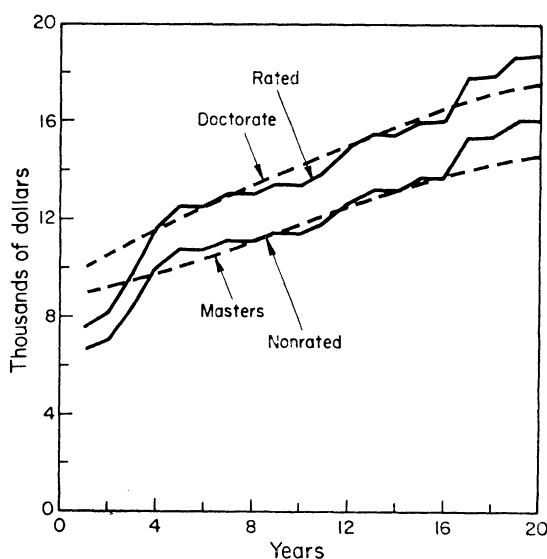


Fig. 1. Comparison of military pay and mean civilian scientist pay by years of experience—1968.

Source: E. Hanushek, "The High Cost of Graduate Education in the Military," *Public Policy* (Fall 1973).

In large part, the inability to control the overall force profile effectively stems from the reliance upon individual incentives and decisions to bring about adjustments in the composition of the force. This passive management of the system is reinforced by historical factors which inhibit or make difficult more positive management.

Two factors lead to an inability to control the composition of the officer force effectively. First, with a desire to attract recruits under the volunteer military plan, entry salaries have risen significantly in recent years. In order to maintain career incentives, these shifts led to an upward movement in the overall pay schedule. The result is that military pay has become more than competitive. There are a number of ways that military pay can be compared with pay in the rest of the economy. Figure 1

displays 1968 officer pay schedules and compares these with pay schedules for civilian scientists.² An officer not drawing any special pay (labelled nonrated) had a current income comparable to a scientist with a Master's degree (even though few had such degrees). An officer drawing special pay such as flight pay (labelled rated) had pay comparable to that of a civilian scientist with a doctorate. Since 1968, military pay has increased more than comparable civilian pay through the shifts due to the volunteer military.

An alternative comparison relates military pay to the pay for Federal employees in grades which are supposed to be comparable in status and responsibility. As shown in Table 1, except in the lowest two military ranks, military pay and benefits are

TABLE 1
Comparisons of Military Pay and Benefits to Federal Civil
Servant Pay and Benefits: October 1975

Military rank/ Civil Service rank ^a	Salaries		Salaries and benefits		Military advantage (+) or disadvantage (—)
	Military ^b	Civilian ^c	Military ^d	Civilian ^e	
Major Gen./GS-18	\$45,808	\$37,800	\$54,815	\$41,350	+ \$13,465
Brig. Gen./GS-17, GS-16	40,652	37,800	48,886	41,350	+ 7,536
Colonel/GS-15	35,534	35,485	43,305	38,849	+ 4,456
Lt. Col./GS-14, GS-13	28,400	28,202	35,101	31,121	+ 3,970
Major/GS-12	23,258	21,970	29,188	24,485	+ 3,703
Captain/GS-11, GS-10	18,750	17,612	24,004	19,729	+ 4,225
1st Lt./GS-9, GS-8	13,707	14,564	15,606	16,403	— 797
2nd Lt./GS-7	11,102	12,518	12,578	14,170	— 1,592

^a Comparisons are made between military rank and the civilian grade that is supposed to be equivalent.

^b Military salaries are regular military compensation which is defined as base pay, quarters and subsistence allowance and Federal tax advantage.

^c Civilian salaries are Step 5 within each grade; for multiple grade equivalents, a simple average is used.

^d Military benefits include estimated actuarial value of retirement, health care, FICA employer contribution, and commissaries and exchanges.

^e Civilian benefits include estimated overtime and holiday pay, government contribution to retirement, and government contribution to life and medical insurance.

Source: Senate Committee on Appropriations, "Report to Accompany HR-9861," Report No. 94-446, p. 19-22.

always greater than civilian pay and benefits. Interestingly, almost all of the attention in discussions of the volunteer military centered upon the entry ranks (both enlisted and officers), and yet these are the only ranks which do not compare favorably with Federal Civil Service grades. For the top ranks, the pay difference between military

² These comparisons include no retirement pay. As discussed below, retirement benefits in the military are probably superior to those of civilian scientists.

TABLE 2
Present Value of Retirement Pay at Different Years of Services and Retirement at 20 Years or 30 Years in 1975 (\$1,000)

Years of service	Service at retirement	
	20 Years	30 Years
0	66	63
1	70	66
2	73	69
3	77	73
4	81	77
5	85	80
6	89	84
7	94	89
8	98	93
9	103	97
10	108	103
11	114	108
12	119	113
13	125	119
14	132	125
15	138	131
16	145	137
17	152	144
18	160	152
19	168	159
20	176	167
21		175
22		184
23		193
24		203
25		213
26		224
27		235
28		247
29		259
30		272

Notes: Calculations give present value of retirement pay at any point of service assuming: (a) an officer retiring at 20 years is an O-5 (Lt. Colonel) and is age 42 with a life expectancy at retirement of 30 additional years; (b) an officer retiring at 30 years is an O-6 (Colonel) and is age 52 with a life expectancy at retirement of 20 additional years. All figures are discounted at 5% and neglect the free family medical benefits that are automatically given to retirees and their spouses for life. These are calculated according to pay schedules of December 31, 1975.

and civilian reaches 33%.³ (Such comparisons further neglect the fact that Federal employee pay may be above general market salaries.)

However, current salary is not the only incentive to stay in the military. The second factor—an attractive, nonvested (or nonportable) retirement plan—also provides a

³ As indicated in the notes to the table, the benefits to the top military ranks are understated to the extent that senior military personnel also often have such benefits as a car and driver, orderlies, etc.

strong incentive to remain in the military during the 10 to 20 years of service period. Military personnel have no retirement rights before 20 years of service. At 20 years, the individual can retire at 50% of his highest base pay. The retirement pay percentage increases at 2.5% for each year after 20 years of service to a maximum of 75% of base pay at 30 years of service.⁴ Table 2 shows the expected present value of retirement pay at different years of service and at different years of retirement. This is the amount (either real or psychic) that an individual must earn (by what would be the retirement point) over and above his military salary in order to equate his civilian opportunities to his military opportunities.⁵ Coupled with the previous data about current salaries, it is not hard to ascertain why virtually nobody desires to depart the military after 10 years of service.

In the private sector, nonvested retirement systems are usually viewed as benefitting the employer (or whoever controls the retirement fund). The employee cannot leave the company or union without forfeiting his retirement rights. The employer, on the other hand, can always choose to dismiss the individual, thereby controlling the structure of his labor force and saving the large sums that would have been demanded under the retirement plan. There is a large element of ruthlessness to such a procedure, of course, and this limits use of such options to an employer as public as the military. A retirement "right" is implied during recruitment. In addition, the amounts of money are so large and the individual complaining so vociferous whenever there is a hint of potential loss of retirement rights that the services—because of equity if not the fear of Congressmen view—force management on the downward side as a last, painful option. In effect, the only way to reduce the number of supervisory people is to bring in fewer 15 to 20 years earlier. Such a policy offers nothing for the present and requires heroic assumptions about our forecasting ability if it is to be relied upon in the future.

Peacetimes, Humps, and Opportunity Costs

Whenever there are pressures to reduce the size of the force, such as now, the ever-ready solution is to look for volunteers (recall the implications of the nonvested retirement system). Many individuals are offered the opportunity to leave before they otherwise could. The natural incentives would draw volunteers from those who perceive outside opportunities as great and the costs of leaving the service as low. Thus, individuals who volunteer to leave would tend to be very junior and tend to obtain above average salaries in the civilian world. (This implies, among other things, that the dollar saving in salaries from a given contraction is almost minimized.) But, the individuals who would tend to leave are just those that the military should want to retain. Within the Armed Services, salaries are rigidly tied to rank and seniority, promotions are highly correlated with age, and all officers, from the most productive

⁴ Retired military personnel also receive free medical services for themselves and their spouses for life and have full privileges to use military commissaries and exchanges.

⁵ This calculation assumes that an individual's civilian potential earnings are the same at each age, regardless of the amount of civilian labor force experience, i.e. that military experience is a perfect substitute for civilian labor force experience. To the extent that military experience is an imperfect substitute, this calculation overstates the implied differential that is required to equate the earnings streams for somebody leaving the military before retirement.

to the least, age at the same rate. Controlling for age then, there are virtually no differences in salary according to ability, and, therefore, no monetary incentives to induce a more productive individual to remain.

Efforts to reduce the size of the force through finding individuals who will voluntarily leave but have not already done so requires removing restraints on individuals that otherwise would have kept them. Officers who have restraints on them (other than those from salary being above opportunity costs) are individuals with a mandatory service obligation. These obligations generally arise from previous training paid for by the military (see below) and include initial service obligations; commitments for advanced military training such as flight training, submarine training, or technical schools; and commitments deriving from graduate education. Thus, individuals who are most likely to be induced to leave voluntarily are individuals whose opportunity costs have been elevated by expensive training provided by the military. This implies that voluntary accession programs to meet short-term goals often lead to increasing the requirements for training within the military.

The impact of voluntary programs on the internal structure of the military can be seen by looking at the military since 1965. Table 3 shows the overall changes in the

TABLE 3
Military Personnel by Service and Proportion Officers: 1965-1975

Service	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
Personnel (1,000s)											
Total ^a	2,655	3,094	3,377	3,548	3,460	3,066	2,715	2,323	2,253	2,162	2,128
Air Force	825	887	897	905	862	791	755	726	691	644	613
Army	969	1,200	1,442	1,570	1,512	1,323	1,124	811	801	783	784
Navy	671	745	752	765	776	693	623	588	565	546	535
% Officers											
Total	12.8	11.3	11.4	11.7	12.1	13.1	13.7	14.5	14.2	14.0	13.7
Air Force	16.0	14.8	15.1	15.5	15.7	16.4	16.7	16.8	16.6	17.1	17.1
Army	11.6	9.8	10.0	10.6	11.4	12.6	13.3	14.9	14.5	13.5	13.1
Navy	11.6	10.7	10.9	11.1	11.0	11.7	12.0	12.4	12.6	12.3	12.3

^a Total figures include the Marine Corp which is not separately shown.

Source: OASD (Comptroller), Directorate for Information Operations (1969-75); OSD, Directorate for Statistical Services (1965-68).

force for the Department of Defense as a whole and for the Army, Navy, and Air Force. The total force in 1975 was 40% below the peak force of 1968. There was some increase in the division between officers and enlisted men; however, this increase was not too large.

The impact on the composition of the officer force was more dramatic. Table 4 shows the ratio of field grade to company grade officers.⁶ In 1965, there were two company grade officers for each field grade officer; by 1975, there were only 1.65 company grade officers for each field grade officer. (In the Navy, the ratio of company grade to field grade officers went from 2.1 in 1965 to 1.45 in 1975 and was as low as 1.38 in 1973.)

In addition to these changes in the rank structure, there has also been a change in the age and experience structure. Part of the reduction in force has come by the services' retiring officers earlier than they otherwise would have.⁷ At the same time, the average length of service for promotion to each rank has increased. Thus, the

TABLE 4
Ratio of Field Grade to Company Grade Officers^a: 1965-1975

Service	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
All	0.500	0.532	0.548	0.537	0.542	0.541	0.559	0.593	0.603	0.618	0.608
Air Force	0.512	0.548	0.662	0.634	0.641	0.605	0.599	0.596	0.597	0.611	0.602
Army	0.521	0.547	0.478	0.454	0.487	0.463	0.494	0.590	0.574	0.603	0.586
Navy	0.476	0.535	0.543	0.546	0.538	0.650	0.665	0.645	0.723	0.718	0.689

^a All figures reflect personnel on June 30 of each year. Field grade ranks are: Colonel, Lt. Colonel and Major; company grade ranks are: Captain, First Lieutenant and Second Lieutenant.

Source: OASD (Comptroller), Directorate for Information Operations (1969-75); OSD, Directorate for Statistical Services (1965-68).

force in 1975 is composed more of individuals in the 12-20 years of service range than would be indicated by simple comparisons of the rank structure between 1965 and 1975. Both of these changes are not neutral with respect to the retirement bill; each increases the retirement bill relative to current salaries for a given distribution by rank.

Interestingly, the Army, which has been forced to absorb the largest cuts both in absolute magnitude and relative magnitude, has shown the least change in the composition of its officer force. This has been the result of the requirement to take more drastic steps by the Army; it has been able to rely less on voluntary accessions than the other services and has been called upon to take more positive actions. This also explains why Army personnel policies have received more attention in the media than

⁶ Company grades are second lieutenant, first lieutenant, and captain; field grades are major, lieutenant colonel, and colonel.

⁷ Almost all reserve officers were required to retire at 20 years of service. Additionally, some officers were allowed to retire before 20 years and others were allowed to retire immediately after promotion.

those of the Air Force and Navy. They have been required to dismiss more officers, and a number of these have been very close to the point where their retirement becomes vested.

The Flying Circus

One of the most peculiar aspects of the military personnel system is the management of pilots, or rated officers. This is especially the case in the Air Force where many supervisory positions must be filled by pilots (even though they may not be directly supervising a flying activity).

The importance of pilots from an efficiency viewpoint arises from the cost of pilot training. Undergraduate pilot training (initial training required of all pilots) is estimated to cost \$181,000. Advanced training (training in a particular aircraft) ranges from \$35,000 for cargo aircraft to over a quarter of a million dollars for fighter aircraft.⁸

With production costs such as these, one would expect special efforts to be exerted to use pilot resources efficiently. However, historical incentives in the Air Force have operated in a different direction. Pilots receive extra pay ranging from \$1,200 to \$2,940 per year. This extra pay plus the enhanced promotion and leadership opportunities available to pilots provides a strong incentive for individuals to become pilots. However, the incentive to actually fly airplanes is considerably less since the level of pay is only partially a function of the quantity of flying. Over the strong protests of the military, Congress in 1974 set two quantitative requirements for the payment of flight pay: to receive flight pay an officer must be assigned to a job requiring a pilot for at least 6 of the first 11 years and at least 11 of the first 18 years after beginning pilot training.⁹ If a pilot meets these requirements, he will receive flight pay continuously until 25 years of service with the amount of pay dependent upon length of service and independent of the actual amount of flying.

There is actually an incentive to individuals to fly the minimum length of time. Promotions, particularly to colonel and general, are predicated on a wide diversity of jobs or management positions. These experiences cannot be gained by staying too long in a flying job.¹⁰

The incentives facing the individual are to spend the minimum amount of time in a flying position and to seek other training and other types of jobs once past the minimum time in flying.

Certainly there are some who would like to fly more than the minimum. If they succeed in continuing to fly, they will likely be penalized in terms of promotion. However, because of the minimum flying requirements for pay purposes, they will probably not be allowed to continue flying because that might make it impossible for some other individual to reach the minimum.

Not surprisingly, the difficulties of managing the pilot force are most severe in the

⁸ These figures are the official Air Force cost estimates for FY 76 contained in AFR 173-10, "Cost and Planning Factors."

⁹ Public Law 93-294, signed into law on May 31, 1974. Prior to the introduction of this "gate" system, there were no restrictions on actual flying service for pay purposes. The military opposed adding such restrictions.

¹⁰ Historically, if one continues to fly, there is an incentive to fly a diversity of aircraft. This obviously has enormous implications for training costs. However, recent retirements of aircraft have slowed such cross-training in aircraft considerably.

Air Force where pilot qualifications are used for purposes other than flying airplanes and where historically there has been an effort to enlarge the number of pilots irrespective of the number of planes. The Navy, which is governed by officers who command ships and not planes, appears to have considerably less problems in managing and utilizing pilots. In the Navy, flying per se is an acceptable career. The Army has gone one step further by developing a corp of pilots who have the rank of warrant officer and whose sole job is to fly, not to command.

The incentives to obtain a wide range of experiences exist in all of the services. However, nowhere is the cost of this incentive structure as apparent as it is in its effects on pilot careers and the corresponding impact on pilot training costs, particularly in the Air Force.

The Training and Schooling Merry-go-round

The general rule with regard to training in the military appears to be “more is always better than less.” In peacetime, almost all activities of military personnel might be considered training. However, formal schooling and training occupies an amazingly large portion of officer’s time, even during wartime situations. Although there is a high variance in the proportion of time spent in formal schooling, it is not difficult to find officers who have spent one quarter to one third of their total careers in formal training.¹¹ Such a figure would certainly amaze employers in the private sector, particularly when the trainees hold such a low opinion of the quality and content of many of these programs.¹²

There are two types of training situations which must be distinguished. First, there are programs which are oriented toward “specific” training—training that is largely concerned with particular military programs and that have little overlap with civilian skills. These include many technical schools (such as infantry training or armaments schools) and professional military education (PME). Second, there are programs which develop “general” skills—skills which overlap those demanded in the private sector. These include graduate training, medical training, etc.

The specific training programs, particularly PME programs, often disregard the background of individuals. Unfortunately, the incentive system never allows individual judgments about the value of training to be translated into the efficient choice of non-attendance. As mentioned above, senior promotions depend upon a wide variety of experience and, therefore, a wide variety of training. Even more pernicious is the process of square filling induced by the promotion incentives. The conventional wisdom requires certain schools for certain promotions and, therefore, many individuals are observed resigning themselves to “wasting a year” in some educational program so as not to remove themselves from the senior promotion competition. While these

¹¹ Unpublished estimates in 1973 of the Education Division, Director of Personnel Programs, Headquarters USAF, indicate an average time in formal training of 18 months. Assuming an average career of 10 years, this implies 15% of all careers spent in a formal training situation.

¹² See, for example, Joseph E. Morsh, “Survey of Air Force Officer Management Activities and Evaluation of Professional Military Education Requirements,” Air Force Human Resources Laboratory TR-69-38, 1969. A distinction should be made between the evaluation of the knowledge gained and the effect of schooling on promotions, although even there questions arise.

schools may benefit some, it is unfortunate that the individual's own evaluation of the potential benefit plays little or no role in the decision to undergo these expensive training programs.

The general training programs offer a different set of incentives to individuals. These programs, such as graduate education, enhance the individual's opportunities outside of the military; this holds whether or not the individual remains in the military until retirement. Thus, individuals have a strong incentive to undertake such training since the military pays the full cost of this training.¹³ As indicated by Figure 1, the military pay structure is such that individuals receive pay that is equivalent to those who pay for training on their own. Therefore, the military cannot pay all of the costs of training and produce their own educated personnel as cheaply as simply hiring individuals in the civilian market with the required skills. For graduate training, the estimated additional costs of filling requirements for different advanced degrees by training military officers instead of hiring civilians was about \$300 million per year in 1968.¹⁴ Certainly some jobs require both military experience and advanced education so that substitution of civilians for military officers would not be desirable. On the other hand, many jobs for individuals with advanced degrees have direct counterparts in the civilian sector. Further, since this advanced education benefits individuals by increasing their lifetime earnings potential, it should at the very least be possible to shift part of the cost of training to the individual. Such shifting would also provide incentives to individuals to evaluate the value of different programs and would effectively bring in information about the availability in the civilian market of individuals with different skills.¹⁵

Finally, apparently little thought is given to the interrelationships between different training programs. Individuals have an incentive to obtain almost as much education and training as is possible because of the promotion incentives to have a wide variety of experiences and skills. There is an incentive not to specialize, and, moreover, there are incentives both to receive redundant training and to not work at jobs which use

¹³ Military personnel who go to civilian schools are paid their full salary while in school and have their tuition and other expenses paid for by the military. After completing schooling, the individual incurs a service obligation which requires him to stay in the military for a length of time that is related to his time in school.

¹⁴ These estimates are found in E. Hanushek, "The High Cost of Graduate Education in the Military," *Public Policy* (Fall 1973). They are based upon the Air Force requirements for approximately 12,000 advanced degrees in 1969 and an education program which sent slightly over 1,500 individuals to school annually. In 1968 dollars, the long-run annual costs of this training program was \$87 million more than it would cost to hire a similar number of civilians with the required degrees. Since the Air Force advanced education program is approximately one-third of the total military program, the estimated annual cost for the entire Department of Defense is approximately \$300 million.

¹⁵ The current military program is in no way linked to the availability of suitably trained individuals in the civilian labor market. Thus, the military sponsors individuals to go to graduate school in such areas as English and history. If individuals paid part of the costs of training, there would be incentives for them not to participate in programs where there currently exists an excess supply of trained individuals. With the current program, there is no incentive to the individual not to participate in programs where the social return is low because the private return remains positive. The only such information linking decisions to civilian markets which is currently obtained comes from the excess supply of volunteers for training into areas which have a higher private return. However, this information does not appear to have any effect on current operations.

the training received.¹⁶ Certainly individuals with broad ranges of skills are desirable, but, at the same time, they are extremely expensive.

The Pay and Benefits Package Jumble

For a number of historical reasons, the military pay and benefits structure has evolved into a confusing mixture of salary, nontaxable allowances, and payments in kind.¹⁷

TABLE 5
Average Underestimates of Military Pay and Benefits by Rank and
Career Intentions: Air Force Pilots, Fall 1973

Average underestimate ^a (1973 \$)	Rank			
	Lt. Colonel	Major	Capt.	Lt.
Total	3,727	3,685	3,508	1,877
Career	3,391	3,308	3,342	1,346
Noncareer ^b	4,500	4,262	3,516	1,610
Percent underestimate				
Total	12.6	15.4	17.3	12.4
Career	11.4	13.4	16.1	8.8
Noncareer ^b	15.3	16.7	17.2	10.9
Sample size				
Total	352	345	433	203
Career	245	198	149	26
Noncareer ^b	106	147	284	177

^a True pay is based upon estimates of OASD (M and RA) reported in *The Congressional Record*, April 4, 1973, p. S6610-S6611.

^b Noncareer includes all individuals planning to retire before 30 years of service. Only a very small percentage of "noncareer" majors and lieutenant colonels intend to leave before 20 years of service.

Source: James Marlin, U.S. Air Force.

¹⁶ Examples of redundant schooling include individuals with advanced degrees in political science, economics, and management attending senior military schools which are designed to provide general instruction in international relations, economics and management. The relationship between degree attainment and utilization shows an amazingly large proportion of individuals who do not work in a field related to their training; see E. Hanushek, "The High Cost of Graduate Education in the Military" and General Accounting Office, "Improvements Needed in Determining Graduate Education Requirements for Military Officer Positions," B-165558, August 28, 1970.

¹⁷ Military pay is composed of: base pay which is determined by rank and longevity; housing allowance which is given if the individual is not provided housing and which is determined by rank and marital status; and subsistence allowance. Housing allowance and subsistence allowance (which comprise between 15 and 30% of officer pay) are nontaxable. If military housing is available, it is provided free, and its value is generally above the rental cost of comparable housing; the amount of housing supplied is determined by rank, marital status, and family composition. Nontaxable benefits include free total family medical services and free dental service for members of the military; subsidized commissaries; and subsidized recreational facilities and activities. Senior officers also have vehicles and drivers provided and sometimes have orderlies and other help. Additionally, all retirement benefits come in the form of employer contributions so that none is taxed as income at the time of contribution.

Portions of the benefit package (e.g., medical services and commissaries) developed historically to meet the demands of service people in remote locations. Undoubtedly also the military has had little interest in altering the dimensions of the package to changed circumstances because the confusion has been beneficial in dealing with Congress about pay matters.

The character of the pay package has two implications for management of the military personnel system. First is the well-known inefficiency of providing benefits in kind instead of income. Second, and less obvious, is the effect of imperfect information by military officers on individual decisions.

The result of this pay package is that few people in the military can accurately assess their total income. In fact, there is a systematic underevaluation of pay and benefits by the members of the military. The amount of underestimation of income is suggested by some crude calculations presented in Table 5. This table presents estimates of the difference between actual and perceived pay for a sample of Air Force pilots in the fall of 1973. While such calculations are difficult to do with complete accuracy, the bias in perceptions is quite suggestive.¹⁸ These data indicate that officers under-value their benefits by 10 to 20 %.

Effectively, because of the in-kind payment and the biased perceptions, military pay and benefit dollars are discounted by the members of the military. This leads to obvious inefficiency and distortions of choices.

Management Alternatives

The point of listing these incentives is simple: There are several current personnel policies which make rational management of the military force quite difficult. This is not to say that the military is in any sense less effective than it should be or that we do not have good, dedicated personnel serving in the military. It is to say, on the other hand, that trying to fight against incentives which are pulling individuals in an undesirable direction must be costly. Either we are paying too much for the services provided or we are exploiting the patriotism and good will of a small segment of the nation. During the Vietnam conflict, a friend who had become mired in the conflicting objectives of personnel policy once said, "This personnel system would work really well if it weren't for this war." The view here is that personnel management was certainly complicated by the war but that it would not work well in the absence of war. The same is true with the volunteer army: the problems we have mentioned would exist without the volunteer army; they only become more costly in the presence of the

¹⁸ Perceptions of total income were obtained from answers to the question, "What do you perceive as your total pay including retirement and other benefits?" Answers to this question were compared to the average benefit calculations done by the Department of Defense and included in *The Congressional Record*, April 4, 1973, p. S6610-S6611. These "actual" figures are necessarily averages (as would be suggested by the previous footnote which indicated how benefits depend upon family size, total family income, etc.). Perhaps the most important problem with calculating true pay and benefits is the treatment of retirement pay. The "true" pay is based upon amortized retirement pay and average retirement rates. This may be why noncareer misperceptions are larger than misperceptions by careerists. However, a large number of noncareerists will actually receive retirement benefits since retirement benefits begin at 20 years of service and the distinction between career and noncareer used in the table is based upon plans to remain in the military for 30 years.

volunteer army. As military pay increases, mistakes in management are more expensive and more noticeable.

1. Retirement Structure

The ever-growing cost of military retirement has been the subject of considerable concern. Even traditional friends of the military in Congress have been pushing for reductions in retirement costs. Reacting to alarming projections about the proportion of the military budget which is paid for past services, the Department of Defense and the various services have been forced to consider possible reductions in the levels of retirement pay. Table 6 displays the trends in retirement (pay for past services)

TABLE 6
Retirement Pay as a Percent of Current Personnel Costs,
Department of Defense: 1965-1976

1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975 ^e	1976 ^e
10.6	10.3	10.0	10.5	11.4	12.4	15.0	17.0	18.7	21.3	24.2	27.5

^e estimated.

Source: *The Budget of the United States Government*, individual years, 1967-76.

relative to current personnel costs (payments for current services). By 1976, retirement costs were more than one quarter of current personnel costs. The previous discussions of the aging of the force indicate that this proportion will continue to rise in the future.

Several things are obvious in these discussions. First, the only way to change the retirement bill by much in the near term is to renege on past contracts since new retirees in any year are a small portion of all retirees. Second, the retirement bill is the product of payments times the number of retirees, and these two terms are by no means independent of each other. Third, and less obvious, is the cost effect of the retirement system on current service wage bills. As we have discussed previously, the retirement system encourages an overabundance of middle-aged officers and enlisted men. In the short run, it may be easier to reduce the "total" cost of retirement by affecting this large quantity of people (and their associated wages) rather than the level of individual retirement payments.

By a simple comparison of the cost of training nonpilots to the cost of retiring them, the current system dictates that there is virtually no nonpilot who should be retired. Of course, this is not possible under the current system because, in the absence of vesting, the issue of equity becomes overwhelming and the implied retirement right is created. The simple answer is some sort of vesting of the retirement fund. This could take the form of lump sum payments to individuals leaving before 20 years or a delayed retirement plan with payments starting at age 65. Such a vesting

system would reduce the tremendous incentive for people either to leave early or stay forever, remove the current inequities which prevent effective reductions in the size of the force, and make the true costs of keeping a large number of people indefinitely much more explicit. The point is that such revisions of retirement pay are needed not only to control the retirement bill but also to allow for rational management of the active duty force.¹⁹

2. Differentiated Contracts

Current personnel policy is such that there is a one-way contract from the individual to the military services. The military services agree on certain pay levels (differentiated chiefly by age and a rated/nonrated distinction), and the individual has no other contract rights. The onesidedness of this contract is not, however, costless. The military services fall into implied contracts (as with retirement rights), and they must, in general, compensate the individual for assuming absolute control over the jobs and locations in which they can place the individual. Further, the contract is set for the entire force, removing most management decisions from the individuals who are actually using the resources. The result is paying too much for a given quality of force. Thus, while it may be natural to think of a two-way contract system as benefitting the employee, it would in fact benefit the employer to specify contract obligations to the employee.

There are several obvious types of contracts which might be considered. These contracts could be tailored to recognize locational preferences or job preferences. They could also provide a closer linkage to the civilian labor market. With the existence of bases in Greenland and other undesirable places, a stateside service contract should call for a lower salary (or higher quality individual) than a general contract which includes an option for the service to send the person someplace where he does not wish to go. Currently, there are many individuals who are never sent to Greenland but are paid as if they might go.

Similarly, many individuals have preferences for working in certain types of jobs. For example, many individuals with graduate training would prefer to work in their area of expertise, but they have no guarantee that this will be possible. As a result, many high quality specialists are reluctant to stay in the military because of this job uncertainty.²⁰ If they manage to continue working in their speciality, they tend to

¹⁹ The Department of Defense has proposed a new retirement system which includes partial vesting. Individuals involuntarily separated after 5 years or voluntarily separating after 10 years would receive some payments. It is really a psychological question, however, as to whether or not these payments are sufficient to remove the implied "retirement right." Further, there are plausible scenarios which would suggest that the retirement bill could actually increase under this proposed plan (by encouraging officers to stay in the military longer). The plan is described in "The Proposed New Military Nondisability Retirement System" (Washington, D.C.: Government Printing Office, 1973).

²⁰ See E. Hanushek, "The High Cost of Graduate Education in the Military," for a discussion of utilization of individuals with advanced degrees. The situation with respect to advanced degrees also holds for other specialities. In a sample of military officers with graduate degrees, the General Accounting Office found less than one-third were assigned to jobs designated as requiring advanced degrees.

be penalized much the same as pilots who continue to fly—they are less likely to be promoted because they do not have a wide range of experiences. Simple recognition of the value of some specialists would help; job specific contracts would be one way of institutionalizing this.

One of the serious problems in managing the force and recognizing different preferences and skills of individuals is the constraint implied by the current pay and promotion schedule. Military rank is used to determine pay, command position, and retention. An individual who is not promoted within a specified period of time cannot have his pay increased and cannot remain in the service. But, if he is promoted, he must be moved to managerial positions as determined by his new rank. Thus, it is not possible for an individual to remain say as a captain and to continue doing a job which he likes and is qualified for. Thus, military rank is the only policy variable, but it is used to address several different goals.

There have been a few notable exceptions to this system. Medical doctors have both been promoted more rapidly than other officers and receive sizable extra pay. Nuclear submarine officers also receive sizable bonuses and extra pay. Finally, enlisted men in many different specialties have received extras determined by their speciality. (Differentiated contracts for enlisted men are much more prevalent than for officers and again reflect the better management of the enlisted force as compared with the officer force.)

The use of differential pay for officers has only occurred in extreme cases. Medical doctors, with much higher opportunity costs, have had to be compensated in order to compete with the civilian market. Nuclear submarine officers, with extremely high training costs and unpleasant working conditions, have also had to be compensated differently than other officers. However, the recognition of differences in jobs and opportunity costs only in extreme situations implies considerable inefficiency in general operation. Other specialties have varying opportunities in the civilian market, and the current system by necessity must pay more than would be required for some specialties in order to attract individuals in other specialties. Differentiated contracts which allowed pay differences for different skills would incorporate the fact that certain skills are scarcer than others. It would also provide a second policy parameter so that selection of managers (one set of skills) could be done independently of purchasing other skills.

Finally, differentiated contracts could also involve consideration of the retirement plan. Undoubtedly, the risk of certain combat situations and the problem of deteriorating physical abilities indicate that short careers (20 years) may be reasonable for some. However, the vast majority of military jobs, even in wartime, do not involve combat. The productive life of individuals on noncombat specialties certainly goes past age 42. The current retirement program is so expensive that training new nonrated officers (even after allowing for productivity growth with experience) may well be preferable to retaining such officers until retirement at 20 years. Making retirement later for these individuals would change this calculation.

Contracts could also be written so that they could be modified in wartime. However, even then, efficiencies could be realized by recognizing the small proportion of actual combatants.

3. Linkages to the Civilian Labor Market

The current personnel system is directly linked to the civilian market only at the entry level. All officers (except medical officers) and all enlisted men must enter at the lowest grades. An extension of the previous discussion of differentiated contracts would allow for more contact with the civilian market either through more civilian contracting or hiring through lateral entry from the civilian sector. Civilian hiring runs into the rigidities in the civil service system and therefore may not be as appealing as a straight lateral entry policy.

Lateral entry would allow for shifting the costs of some training to individuals. This is less feasible now since someone who enters with training (say a graduate degree) is paid the same as someone who enters with no training.

4. Pilots and Other Expensive Individuals

In simplest terms, the utilization patterns of officers can have dramatic effects on training costs. Nowhere is this as obvious as it is in the case of pilots. The training of a single pilot to fly an operational aircraft costs over \$150,000 and can approach a half million dollars. Low utilization rates of officers implies that there must be a large stock of pilots, and this implies higher training rates than would be necessary with higher utilization rates.

In the Air Force, as of December 31, 1975, there were 29,441 pilots (roughly 30% of the officer force).²¹ Of these pilots, 55.4% were in flying jobs or preparing to go into flying jobs,²² 23.2% were in supervisory jobs designated as requiring a rated individual,²³ and the remainder (21.4%) were either in the rated supplement or in graduate school or a professional military school.²⁴

Over 40% of the pilot force are thus not assigned to an actual flying job. Certainly because of the possible necessity to surge in case of war, the number of pilots should be somewhat higher than the number of cockpit jobs. However, the current surplus seems excessive.²⁵ One reason for this large number of nonflying pilots is the incentive

²¹ The figures on the size and the distribution of the pilot force were provided by the personnel office of Air Force headquarters (AF/DPXX).

²² Of the 14,316 officers in flying jobs or assigned to flying jobs, 9,234 were actually in flying assignments; 2,992 were in training; 1,439 were in the pipeline awaiting entrance to either a training or flying position; and 651 were actually in transit to a new flying position. Thus, only two-thirds of the "flying force" are occupying cockpit seats in operational units.

²³ Certain Air Force supervisory positions are designated as requiring a pilot. Essentially any unit which is connected directly to flying must be supervised by a pilot.

²⁴ The rated supplement is the reserve army of pilots who would be available in wartime to reenter flying jobs but are not currently in flying jobs.

²⁵ Some evidence about wartime requirements can be obtained from the Vietnam experience. The Air Force operated on a one year/one tour policy and did not exhaust the number of pilots during the war. The Army, Navy and Marine Corps operated much more demanding policies during Vietnam within the current monetary incentive structure. More demanding policies impact upon retention rates of pilots, but there is a considerable range of retention rates where higher utilization is cheaper. In any event, for short conflicts, the number of planes and not the number of pilots is the binding constraint. For longer conflicts there is time to increase the production of pilots.

Air Force plans call for a reduction in the number of pilots by some 2,500 by the end of FY 1976. Unfortunately, at least part of this reduction will come from allowing newly trained pilots either to not fly or to leave the Air Force altogether.

structure sketched above; that is, the incentive to go to pilot training and then to obtain varied experiences by not flying. The recently enacted requirements for given lengths of flying experience at the eleventh and eighteenth years of service provided crude quantitative restraints and force higher utilization than was obtained prior to their introduction.²⁶

An alternative to the quantitative restraints would be the use of direct incentives. Pilots who are actually flying planes could be paid a very large bonus. This would shift the incentives so that pilots would want to keep flying. The magnitude of the training costs are such that a flying bonus could be very large.

For concreteness, let's look at a simple example. Say we set the flying bonus at \$1,000 per month. Abolishing one \$200,000 training makes up for over 16 man-years of this flying bonus. The changes in utilization do not have to be drastic to yield large savings, either. Encouraging pilots to continue flying for 2 years above what they currently would means reducing pilot training costs by one quarter to one third.

The same sort of logic holds for other individuals with large training costs. Already the Navy has instituted such a system for nuclear submarine officers. Similar programs could be instituted with respect to graduate training. (This is a second best alternative with graduate training where direct hiring of skilled individuals still seems preferable.)

The military is aware of training costs and the need to retain individuals who have undergone training. However, the current system involves service commitments (but not necessarily utilization commitments). Further, the length of service commitment is not closely related to the cost of training or the increase in opportunity costs of the trained individual. For example, the commitment from two years of graduate training is longer than the commitment for pilot training.

5. Improved Information

There are many advantages which accrue from improving information flows between the individual and his military employer. For example, the publication of a small four-color pamphlet clearly delineating the equivalent salaries of military personnel would substantially increase the effect of these salaries. (Actually paying the real salaries would be the most effective means of all, of course, and would probably allow reducing salaries for a given quality of force.) Just as the essence of deterrence requires full disclosure to the enemy, the essence of an incentive requires full disclosure to the recipients. Even greater gains, however, would come from strengthening the information flows from the individual to the military employer. The individual can provide considerable information about his desires and abilities which would allow more effective utilization of his time and skills. The easiest example comes from the training situation. The individual can provide much more accurate information about the efficacy of various training programs than a central selection board could ever obtain. But, there are presently very imperfect ways to gather this information

²⁶ Prior to the introduction of the "gate" system, the only check on the number of pilots came through limitations on the production of new pilots. Even with twice as many pilots as flying jobs, the Air Force argued that there was a pilot shortage and that new production had to be increased. In reality, the incentive structure meant that there was a shortage of pilots who wanted to fly planes.

and, all too frequently, there are positive incentives to suppress this information. For example, restructuring of promotion criteria by making nonattendance a viable choice for all training options would measurably improve the efficiency of the system.

There are several ways to improve the information flow and the actual operations of the personnel system. The contract system suggested above clearly capitalizes upon individual information. Training decisions could also be made more participative. For example, an individual sent to graduate school might accept a lower salary during training. A vested retirement system would permit free choice to operate via attrition and identify gross misuses of talent that would otherwise go undetected. In fact, almost any incentive structure which promotes and permits freedom of choice would aid in this direction.

Conclusions

The central theme of this discussion is that many of the largest personnel problems are exacerbated, if not caused by, the incentive system. Many of these incentives were developed for historic reasons that are no longer applicable. With the introduction of a volunteer army, mistakes in the personnel system become more costly. And, finally, some adjustment of the most perverse incentives could lead to a self-correction of many glaring problems.