THE VALUE DIMENSION OF PROFESSIONALISM:

SOME REFLECTIONS

by

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ARMY and USAF review(s) completed.

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Discussing professionalism with a group of professionals is much like discussing the aroma of coffee with a group of Brazilian coffee tasters. Both professionalism and coffee aroma are readily recognizable by experts in the respective fields and can be graded accordingly. In neither case, however, is one thereby prepared to define the concepts in question. Convinced as I am that this modest observation represents deep and abiding philosophical problems in the theory of meaning, I do not presume in this paper to attempt to define professionalism. Instead I shall aim at exploring one limited aspect of professionalism as it applies to the modern military. Specifically I shall discuss the relationship between military professionalism and integrity, suggesting that the truly unique characteristics of the professional military officer lie precisely in the values that he holds and thus intersect what we commonly consider to be his integrity. Most of my examples will be drawn from experiences internal to the Air Force. Nevertheless, I hope that the remarks will be broad enough so as to find application in the sister services.

The Nature of Professionalism

Let me preface my discussion with the drawing of several perhaps obvious but still vital distinctions, with regard to the concept of professionalism itself. There are at least two distinct senses in which we speak of this concept. In the first sense professionalism connotes excellent performance in one's job. In this sense, cutting across all spheres of expertise and all categories of occupation, one can envision the somewhat extreme case of a prostitute being 'professional' in much the same manner as the most respected Supreme Court Justice is 'professional': namely, where they have both mastered

the nuances of their trades, are equally conscientious and devoted in per-
forming their respective jobs, and both take pride in their work. In an age
where merely adequate performance has come to be regarded as a kind of excellence,
it would be inviting to dwell at some length on this initial sense of the
'professionalism' idiom. I shall resist that temptation, however, for I
would suggest that this first sense of the phrase is not central to the cen-
tury and three-quarters old debate in the United States military on what con-
stitutes military professionalism.

The really central issue around which this debate has been structured has
been largely identified in the seminal work of Professor Samuel P. Huntington
of Harvard University in his 1957 book The Soldier and the State.[1] Huntington
contends, as I am sure you all are aware, that any profession is characterized
as a vocation apart from other vocations by three kinds of characteristics:
expertise, corporateness, and responsibility. Let me expand on these cate-
gories for a moment. Expertise, Huntington argues, is the specialized skill
and knowledge that a practitioner of the profession ('a professional') possesses.
Applying this category to the military, Huntington then advances the controversial
thesis that it is precisely in the area of expertise that the military profession
differs from all other professions. Using a phrase originally coined by
Harold Lasswell, Huntington contends that the specific expertise of officership
is "the management of violence." This skill constitutes, he argues, the
identifying feature of the professional military man.

I do not propose to retread at length the semantic battleground on which
the controversy concerning that thesis has raged. I shall merely advance
three general types of arguments which lead me to believe that Professor

Huntington is wrong in his thesis, but wrong in an illuminating way. First, as has been eloquently argued elsewhere by men such as Bradford and Murphy, the phrase "management of violence" is too narrow to capture the range of tasks that a modern military career officer can reasonably be expected to perform in his professional capacity during his career.[2] Huntington has simply adopted too narrow a criterion of military professionalism, thereby missing those politico-social functions of the modern military which have formed so major a part of its role in the past two decades.

Second, many tasks of the modern military officer cannot fruitfully be explicated by the "management of violence" idiom. To begin with, a larger portion by far of modern Air Force activity is devoted to "organizing, training, and equipping air forces" than is to "the conduct of prompt and sustained combat operations in the air." This is by no means a denial of the directing importance of the combat ethic -- the realization that the final goal of all Air Force activities in peacetime is victory in combat in pursuit of legitimate political goals or, perhaps more importantly in a nuclear age, the assured threat of victory in combat, should such combat ever result. It is, instead, a commentary on the implications of the modern military environment. Even if combat never again occurs, even if the United States never finds it necessary to fight another war, it nevertheless remains true that the tasks now being performed by military officers remain just as much a manifestation of professionalism as if they were being called upon to actually 'manage violence' -- i.e., to fight and direct fighting. In other words, one need never actualize the management of violence to be a military professionalism, but need only satisfy the somewhat weaker condition of preparing for the management of violence to be so counted. This implies, I would suggest, that

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there is something strange about saying that _the_ management of violence is a necessary (and perhaps sufficient) condition of one's being counted a military professional.

Moreover, I would argue that many military officers in combat environments while not 'managing violence' in the ordinary meaning of the phrase are neverthe- less engaged in professional military pursuits and are thereby to be counted as professionals in the fullest meaning of the phrase. Consider, for instance, those support personnel at air bases in Thailand at the height of the "Rolling Thunder" Air Campaign, directed against North Vietnam. If we select the position of the Tactical Fighter Wing Combat Intelligence Officer as perhaps being repre- sentative of many other support functions, we find the following. An officer in this position was not _managing_ violence, although his military activities _supported_ the management of violence. It would only be under the most extreme conditions that he could be expected to be called upon to manage violence. There were, as I recall, several pistols available in the Wing Intelligence Division, adjacent to the Combat Operations Center and crew planning/briefing rooms, at Takhli Royal Thai Air Base in the late 1960's. These pistols were to be used in defense of classified documents, should Communist insurgents somehow penetrate to the bowels of this otherwise heavily guarded headquarters structure. One can envision some early morning scene with insurgents pounding on the locked doors of the Intelligence Division and with some young Lieutenant supervising the distribution of the pistols to several sleepy airmen. This would surely be an instance of _managing_ violence, but it seems rather silly to try to argue that only on that one morning was that Lieutenant a _professional_ military man, while on the other three hundred and sixty four mornings of his

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Southeast Asian tour he was not.

I need not belabor this point, nor do I intend to hang the weight of my argument on this conceptual peg. It may well be that the sense of 'managing violence' can be sufficiently extended so as to encompass the sorts of peacetime and support functions that I discussed (as Huntington himself attempts to do), but I doubt it. Leaving that consideration aside, however, let me advance one final argument. If the management of violence is the distinguishing feature of the military profession which sets it apart from other professions, then it should be the case that no other profession possesses just that feature. There is, I would contend, at least one other profession in the American tradition which also is expert in managing violence: this is the police profession. If that term be too broad, let us focus our attention on one segment of the overall 'police' profession which does seem to possess those qualities of what Huntington calls a 'bureaucratic profession': namely, the Federal Bureau of Investigation (FBI).

Political philosophers have long noted that so far as the legitimacy of the exercise of coercive violence by the state is concerned, little (if any) theoretical distinction exists between internal and external exercise of that violence — i.e., between the police powers and the war-making powers of the state. Thus, while its task may be geographically more circumspect than that of the military and while the degree of violence normally employed may be less, the FBI is nevertheless concerned in its professional capacity with the management of violence. Indeed, there are those who argue that in the modern world, it is the military instrument that is more coming to resemble the police instrument of the state, and not vice versa.[3] Nevertheless, the point I am making is this:

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if we are to count the 'management of violence' as _the_ identifying feature of the profession in question, then no logical distinction remains between the military and the FBI in terms of their professional status. While this does not necessarily entail any semantic absurdity, insofar as some may feel quite comfortable in speaking of the FBI as a paramilitary organization or of the military as a parapolice organization, there still seems to be some residual sense in which we do not want to characterize the FBI as truly being military, and vice versa. It is to that residual sense that I now turn my attention.

Professional Commitment

My remarks thus far have not been intended to show that expertise in the management of violence is not an important feature of the military profession; I have merely aimed at showing that it is not the only feature of the military profession nor, I shall now argue, the most important one. With the first of these two contentions Professor Huntington would surely agree, for he also discusses at length corporateness and responsibility in a military context. My contention is that those sorts of features, which are representative of the value dimension of military professionalism, are the truly distinguishing features of the profession of arms.[4] This is not an original insight by any means, but the major implications of adopting this perspective have not, in my opinion, been adequately explored to date.

To begin with, one can note that the earliest meaning of the term 'profession' in the English language had value connotations, as opposed to its being a merely descriptive term. According to the unabridged edition of the Oxford English Dictionary, 'profession' was first used in the English language (or at least had its first recorded use) in the thirteenth century, when the term was employed to

denote the practice of one who had by declaration, promise, or vow entered into a religious order. (We might note that this usage has survived in somewhat the same form into this century, in the sense that we speak of a 'profession of faith'). It was not until the sixteenth century that 'profession' began to be used in the more descriptive sense with which we are familiar: namely (to quote the Oxford English Dictionary) that of "a vocation in which a professed knowledge of some department of learning or science is used in its application to the affairs of others or in the practice of an art founded upon it." I discuss this distinction of meaning not to suggest that temporal span of usage somehow ordains the most important meaning of a concept, but merely to note an interesting etymological feature of the 'profession' idiom, which I shall now pursue.

Consider, for a moment, the root of the term 'professional'. In common with the term 'professor', it carries the connotation of one who professes. Whereas the professor only professes a claim to a specific body of knowledge or expertise, however, the professional claims this expertise as well as professing a commitment with social ramifications. In this sense, the professional is voluntarily undertaking responsibilities, usually articulated in the form of an oath or commission of office. And, as has been pointed out, the commitment undertaken has social import: e.g., the lawyer professes a commitment to promote justice, the doctor professes a commitment to promote health and healing, the (college) professor professes a commitment to the imparting of wisdom or truth. What, then, does the military officer profess a commitment to?

Initially we might say that the officer's commitment is to defend the nation against all enemies, foreign or domestic. To examine what we mean by this, however,

it is necessary to consider another useful distinction that Huntington employs.
Huntington distinguishes between two categories of professions. The first type,
which he terms 'associational' professions, are those in which one discharges
his professional commitment by serving individual persons: the lawyer serves
his client, the doctor serves his patient, the professor serves his student,
and so forth. While there may exist professional capacities for members of
these professions in which service is not directed toward individuals, it is
nevertheless the case that service to individuals is the centrally important way
in which an associational professional exercises his expertise.

By way of contrast to the associational profession, Huntington draws our
attention to what he terms 'burearcratic' professions. This profession-type is
one in which the professional commitment is primarily discharged by serving
the society as a whole, and one thus is led to speak in such a context of
'service to the state'. Examples of bureaucratic professions are the Foreign
Service, the FBI, and (most relevant for our purposes) the military, or at
least the professional officer corps.

Professor Huntington's model of profession-types is useful, then, in determining
how the military is distinguished from all other professions. Professional
commitment characterized as service to the state serves to distinguish it
from all associational professions, such as medicine or law. And as we shall
now see, the nature of the commitment also serves to distinguish the military
from the remaining professional organizations, such as the Foreign Service or
the FBI.

The military's professional commitment, it has been contended, is unconditional,
both in terms of geographical boundaries and personal reservations. The meaning
of this claim might be clarified by considering the following observations.

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In 1950 the Stearns-Eisenhower Committee, chartered by Secretary of Defense Forrestal to apply the lessons of American wartime experience to a review of the pre-commissioning programs at the service academies, issued a report in which it was concluded that the professional commitment of officers must be such that "loyalty to their country and to the cause to which it is committed must be unquestioned."[5] Slightly more than a decade later but in much the same tone, Lt.-General Sir John Winthrop Hackett in his Lees Knowles lectures on "The Profession of Arms," given at Trinity College, Cambridge, said the following: "The essential basis of the military life is the ordered application of force under an unlimited liability. It is the unlimited liability which sets the man who embraces this life somewhat apart."[6] And in a 1965 article in the Air University Review, in which he reflected on his almost twenty years of association with the Air Force, the Honorable Eugene M. Zuckert concluded: "There is a binding force that makes you part of an identifiable profession. That force is made up of a great many elements.../including/ a stern imperative which, in itself, sets the military profession apart from all others — the total commitment to place your responsibilities and duty to your country ahead of personal convenience or gain, or life itself."[7]

The Military Profession and Personal Integrity

If my arguments thus far have been correct, it would seem that we have arrived at the heart of the concept of professionalism, so far as the issue of military professionalism is concerned. Expertise relating to the management of violence and, more importantly, an unconditional commitment to service to one's country characterize the military profession. The conjunction of these two concepts deploys a great deal of light on the concept of the profession of arms. Are there any implications of this view which puzzle us, however?

Most public discussion of officership which one encounters (and indeed, it appears, most public discussion of any kind of professionalism) supports the notion that the ideal professional man is a man of integrity. Integrity, like courage, is a term which in the lexicon of the American military tradition has been ordained to martial sainthood. Hence, conventional military usage sanctions the nearly tautological truth that the truly professional officer is one whose integrity is beyond question. What, though, do we mean by this seemingly simple but (at least to students of moral philosophy) terribly convoluted phrase, 'integrity'? I shall not attempt to exhaustively list the subordinate concepts which are collected in the net of the 'integrity' idiom. Instead, let me focus on three notions which, as shall be argued shortly, seem to lead to perplexing implications if the value of unconditional commitment is adopted as the value dimension of military professionalism. Those notions are reason, self-respect, and being true to one's sincere convictions.

At first glance it might seem that one need not be a mature, fully rational man in order to be a man of integrity. Is it not the case that being true to one's convictions, no matter what the reasons for which those convictions are held, is all that is required to make one a man of integrity? This question has a long history in moral philosophy, and I shall in the present paper merely sketch the broadest outline of the form that its answer takes. Briefly, one finds that the eighteenth century philosopher Immanuel Kant convincingly argued that it is not sufficient to simply do one's moral duties in order to be counted as a morally praiseworthy man, which is roughly what we mean by a man of integrity. Kant contended that one must choose to do his duties for the right

sorts of reasons: namely, that he recognizes these duties to be rational demands placed upon his behavior and thus actively seeks to cultivate a _sense of duty_, a sense of respect for the moral requirements that duty entails. Viewed from this perspective, it becomes apparent that one cannot truly be a man of integrity unless he exercises his reason to the fullest extent that he can. Moreover, if one continues to employ the Kantian framework, he also finds that a man cannot retain his integrity unless he has a deep sense of self-respect (or, to employ Kant's idiom, a man cannot have integrity unless he treats himself solely as an end in itself and never as a means to an end only).

In its most abbreviated form, this sketch indicates the reasons why I argue that a man of integrity must be rational, self-respecting, and true to his convictions. Taking those concepts in conjunction with the value of unconditional commitment, we find the following two puzzles emerging. First, does the unconditional commitment clause of the officer's professional contract mean that he must always be willing to fight to the death in combat in order to maintain his integrity? And second, does unconditional commitment mean that an officer must have unquestioning loyalty to the cause to which his nation is committed, without any mental reservation whatsoever? Let us briefly examine these questions.

The first question arises when in attempts to define what is meant by unconditional commitment, it is suggested that the phrase simply connotes that a professional military man is prepared to give up his life in service to his country. In a sense this is true, of course. But is it true only of the military officer and not of other professional men? A lawyer, for instance, may well feel professionally committed to defending a publicly hated defendant, even though the lawyer receives anonymous threats to kill him if he goes through

with the defense and even if he assesses the probability of the threats being carried out as relatively high. To act otherwise would seem to be to do a disservice to justice. Similarly, a doctor treating a rare disease may feel professionally responsible to carry through the treatment, even though he thereby risks contracting the disease and dying. Such examples could be constructed, I am confident, for any of the professions discussed in this paper. Is there, then, a real distinction between the professional officer and other professionals, in the officer's readiness to die for his country?

One might respond at this point that the real difference lies in the nature of the readiness to die. The lawyer or the doctor may be praised for his courage in the above examples, but are we really prepared to always and everywhere unequivocally condemn the lawyer or the doctor who consciously elects to serve only those clients whose causes don't involve the threat of death or personal harm, leaving the serving of clients with dangerous cases to the braver members of his profession? At best we probably think that the doctor or the lawyer has an imperfect duty to serve any and all clients. Such an attitude toward service is an ideal to be aimed at, but it doesn't form the lowest common denominator of their respective professions. By contrast, however, any officer is under the strict requirements of the American Fighting Man's Code of Conduct, and thus seems to be morally required to press his service to the death. Indeed, a great deal of the current debate arising out of the experiences of the POW's returning from North Korea (in the case of the Pueblo's crew) or from North Vietnam deals with just this issue. For the professional officer, what is meant by phrases like 'never surrender of your own free will' or 'never surrender while you still have the means to resist'? Is it the case that to fully live up to one's professional commitment, and hence to retain

one's self-respect, one must view the profession of arms, first and foremost,
as a calling to die in the service of one's country?

Or consider the somewhat related issue of what is meant by saying that
unconditional commitment means that one must have <u>unquestioning</u> loyalty to
his country and to its cause. Can we prepare an officer to be a rational,
mature, and often highly educated professional man and still expect that he
never harbor any doubts as to the morality of the cause of his country or
of the actions that he is legitimately called upon to do in pursuit of that
cause? If we adopt a weaker view and allow for his occasionally harboring
such doubts, can we then expect him to be true to his conscience and still
be unquestioningly loyal?

These are but two of the more obvious ways in which the view of professionalism
as unconditional commitment impacts on the concept of personal integrity. If
to end here would seem to depart the issue on an unnecessarily pessimistic
note, let me indicate that I feel strongly that there are ways one can deal
with both of these puzzling intersections of professionalism and integrity,
so as to preserve the core of the unconditional-commitment clause while
allowing that the commitment so undertaken is enlightened enough to satisfy
the most stringent requirements of integrity for the most demandingly moral
man. Given the time it would take to adequately develop those considerations,
however, I will leave them for another occasion, and will thus end this essay
on the following note. Whatever the value dimension of military professionalism
that one considers, he never departs from the following plateau, so ably described
by Marcus Aurelius in Book V of his <u>Meditations</u>: "In the morning when thou
risest unwillingly, let this thought be present -- I am rising to the work of
a human being."

Notes

1. Samuel P. Huntington. The Soldier and the State: The Theory and Politics of Civil-Military Relations (Cambridge: Harvard University Press, 1957).

2. Zeb B. Bradford, Jr., and James R. Murphy, "A New Look at the Military Profession," Army (February 1969), pp. 58-64, reprinted with minor changes in Richard G. Head and Ervin J. Rokke (eds.), American Defense Policy, 3rd ed. (Baltimore: The John Hopkins University Press, 1973), pp. 512-19.

3. Morris Janowitz has argued this point in chapter twenty of his book The Professional Soldier: A Social and Political Portrait (New York: The Free Press, 1960).

4. I am using this phrase 'the profession of arms' in much the same sense that Sir John Winthrop Hackett does in his 1962 Lees Knowles lectures at Trinity College, Cambridge, published as The Profession of Arms (London: The Times Publishing Company Limited).

5. A Report and Recommendation to the Secretary of Defense by the Service Academy Board (Department of Defense, January 1950), p. 3.

6. Hackett, op. cit., p. 63.

7. Eugene M. Zuckert, "Some Reflections on the Military Profession," Air University Review, XVII: 1 (November-December 1965), pp. 2-9.

EVALUATION, INFLATION, AND ORDER OF MERIT

by

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EVALUATION, INFLATION, AND ORDER OF MERIT

Most professionals, as a result of their initial training and subsequent qualification in a given specialty, can expect to practice their chosen vocation throughout their productive lives. Hence, a person, by virtue of having passed his bar exams, can expect to practice law for as long as he cares to. He may be the most successful lawyer around or he may barely eke out a living. Nevertheless, barring any out and out acts of incompetence or misbehavior, no higher authority can ask him to stop practicing law as part of a "reduction in force" in the legal profession. The same holds true for engineers, doctors and most other professionals.

There are two professions that come to mind where the above does not hold true--military officers and professional athletes. If all goes well, the former can look forward to 30 or more years in their profession. The latter can look forward to 10 or so years. Differences in length of service and pay notwithstanding, there are many similarities between the career of the professional Army officer and the professional football player. Both must perform well enough in comparison to their peers to survive the winnowing process as only the top performers are retained and others are let go to make room for new, younger talent. Both must face the problem of rapidly becoming too old to handle the physical demands of the job, although this is not nearly so traumatic for the Army officer provided he advances in rank to positions that require less and less physical prowess.

The comparison between the officer and the athlete could be carried out to the nth degree, and for some it might be interesting to do so. However, my purpose here is to dramatize the "do well or you're out" nature of both professions and to make the point that, in each, questions of _how_ _well_ performance and potential are measured are crucial to what kind of team you'll be able to field. Furthermore, my contention is that coaches are keenly aware of this and that **military officers are** not.

To explain why I believe this is so, we must begin with a discussion of the phenomenon of "actual variation" when weighted scoring systems are used to differentiate between the performance and potential of a number of individuals. The phenomenon can be demonstrated with a simple example. Suppose there is a need to select the top 300 out of a group of 1,000 applicants for a particular job. Two criteria are selected--mathematical ability and athletic ability. Furthermore, it is determined that mathematical ability is twice as important as athletic ability. Mathematical ability is to be measured by the SAT (math) test developed by the College Entrance Examination Board. Athletic ability is to be measured by participation in high school athletics--100 points for participation, 200 points for a J.V. letter, 300 points for a varsity letter and 400 points for special honors (all-city, all-state, etc.). Given that the maximum score on the SAT(M) is 800, the following table apparently reflects the boss' guidance.

Event	Maximum Points	Apparent Variation
SAT(M) score	800	0 to 800
HS sports	400	0 to 400
Total	1,200	0 to 1,200

The table is misleading because the apparent variation is markedly different from the meaningful variation which will actually determine the final order of the 1,000 applicants. This is because it is impossible to get a zero on a SAT test. You are given 200 points just for writing your name in at the top of the answer sheet. Moreover, unless you deliberately violate all the basic mathematical principles you've learned in high school, you can expect to score at least 200 more points for a total of 400. At the other extreme, you can expect maybe four or five applicants to score above 750. Actually, the serious competitors will range somewhere between 550 to 750 points. Thus, the meaningful variation is 200. In the case of athletics, the serious contender must have at least been a participant in some high school sport. Thus, the meaningful spread will be between 100 to 400 points. As a result (not counting the four or five mathematical geniuses who never participated in sports), most of the applicants will be rank ordered in the top 300 based on the following point spread.

Event	Points Awarded	Meaningful Variation
SAT(M)	550- 750	0-200
Athletics	100- 400	0-300
Total	650-1150	0-500

The top 300 applicants will have anywhere from 650 to 1,150 points. In other words, only 500 of the original 1,200 points will have any true meaning as far as determining who the winners will be. A top athlete (400 points) who is still competitive mathematically (550 points) will score 950 points.

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A top scholar (750 points) who had some participation in a high school sport (100 points) will score 850 points. Thus, the top athlete will score 100 more points than the top mathematician. This is hardly what the boss intended. Recall that he wanted the scoring weighted 2 to 1 in favor of the mathematician. Instead, because the SAT(M) scores are inflated, he got a scoring system that is weighted 3 to 2 in favor of the athlete. Unless the leader understands the phenomenon of meaningful variation and investigates the scoring system being used in some detail, he will not be aware of what is going on. For in all probability the only numbers he will see is the total score listed after each candidate's name on the final order of merit list. In fact, when the personnel director later begins looking at the files of the winners, as he assigns them to various units of the company, he may note the unusually high number of high school letter winners in the group and pass this observation along to the boss. The boss, in turn, may draw the conclusion that varsity lettermen are good mathematicians. "Armed with the facts," he may even go so far as to announce his findings to his business associates at their next gathering.

Now let's take a hypothetical military situation where, again, only two criteria will be used to determine an order of merit list (OML). In this case, manner of performance as measured by an average percentile score of each officer's efficiency reports and his level of civilian schooling are the two criteria. Because manner of performance is considered to be so much more important than civil schooling, the scoring system is set up as follows:

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Item	Weight	Maximum Points	Apparent Variation
OER	(average %) x 400	400	0 to 400
Civil Schooling	15 or 30 or 40*	40	0 to 40
Total		440	0 to 440

The OER appears to be 10 times more heavily weighted than the level of civil schooling attained. However, an examination of the actual variation reveals something entirely different. Officer Efficiency Reports have become so inflated that for an officer to be in any sort of serious contention, he must be somewhere in the 95 to 100 percentile bracket. At the same time, the civil schooling points are "either/or" points. A few officers may get some points between 15 and 30 because they've done some work toward a master's degree but most will get either 0, 15, 30 or 40 points. As a result (not counting those very few officers who have a perfect OER average and no baccalaureate degree or the officer with a Ph.D. and an OER average less than 95 percent) most of the contenders for selection to a service school or for promotion will be rank ordered high enough to be considered according to the following point spread.

Item	Points Awarded	Meaningful Variation
OER Average (95 to 99)	380 - 396	0 - 16
Civil Schooling	15 or 30	0 or 15
Total	395 - 426	0 - 31

The message from the above is quite clear--get a master's degree. It's worth 15 points and will shoot you way up on the OML. Raising your

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*15 for a baccalaureate degree, 30 for a master's degree, and 40 for a doctoral degree.

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OER average, on the other hand, will be somewhat more difficult. In any event, each percentile point is only worth four weighted points. Moreover, given the fact that efficiency reports are becoming even more inflated over time, your OER average will probably go up a point anyway. Thus, the irony is that a master's degree will make an officer more competitive for selection to a senior service school which, while not its primary purpose, is set up to assist officers in getting a master's degree.

In the unsophisticated example described above, inflated efficiency reports can have another even more insidious effect. This is caused by the individual rater or indorser (whatever his motivation) who decides to singlehandedly fight the inflationary trend by strictly interpreting the rules for completing OERs. First, he uniformly lowers the standing on a given OML of all the officers he rates in relation to where they would have been with most other raters. This complicates the problem of trying to differentiate between officers based on their manner of performance. Secondly, and perhaps even less well understood, he masks the true inflation in the system by pulling down the overall average of the system.

The net effect of inflated OERs is to create a "one strike and you're out" atmosphere. Each rating period can be likened to a baseball game where you get only one strike and you must either hit a home run or you're out. Whether an officer strikes out due to a tricky pitch (rating from a consistently low rater) or because of the officer's lack of ability does not really matter. He is relegated to the minor leagues. Thus, changing the weighting system described above by doubling or tripling the points given for OERs from 400 to 800 or 1,200 in order to have them

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count more against a master's degree simply increases the "one strike and you're out" dilemma. It is self-defeating because each of the available percentage points (from 95% to 100%) takes on such a heavily weighted incremental value that the difference between a 96 percent and a 98 percent is enough to move an officer markedly up or down on the OML.

Both of the merit list examples cited above are, or course, notional and are not complete models of existing order of merit systems. They are instead unsophisticated and somewhat overdrawn examples of what can occur when the phenomenon of "meaningful variation" is not given due consideration. Nonetheless, I suspect that the two examples are rough enough approximations of the real problem to cause some uneasiness on the part of two groups--college admissions officers and those involved with the officer evaluation system.

In this case the Army's problem can be easily stated. Officer efficiency reports are becoming so inflated that it is increasingly difficult to use them for their intended purpose--namely, to identify differences in the manner of performance of officers in each peer group. The solution to the problem is not so easily stated.

Over the years, most of us have come to look upon the OER as a counseling tool and as a method for rewarding our subordinates for the good work they had done for us. The latter is probably why the word picture sections of most OERs read like citations for an award. We have tended to forget that the efficiency report is not for the benefit of the individual but for the Army. It is the basic document by which the Army's personnel managers make the key decisions which determine the nature and

character of the leadership of the US Army. It is for the good of the Army--not the individual--that the difficult decisions are made as to who should be promoted (and how soon), who should be afforded further military and civilian schooling, and who should be selected for key command and staff positions.

A study completed in May 1973 at the US Army War College determined that of the items contained in an officer's file, the following 11 were predictors of merit in selecting officers for promotion to colonel.*

Of Major Value

- Late-career performance (OER, DA Form 67-6)
- Combat manner of performance
- Command manner of performance
- Staff manner of performance and level

Of Minor Value

- Military education level
- Civilian education level
- Valor awards
- Merit awards

Of Negligible Value

- Early-career performance (DA Forms 67-2, 3 and 4)
- Mid-career performance (DA Form 67-5)
- Time in combat

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*Colonels Heathcock, O'Shei, Schwartzkopf and Smith, Military Merit: How to Measure Who Measures Up, Special Project Report, US Army War College, 14 May 1973. The study team used a number of surveys; 32 simulated promotion boards using the sanitized files of the five officers above the cutoff point for selection to colonel in 1971 and the five officers immediately below the cutoff; three simulated boards which in addition included 10 randomly selected records of those who were subsequently promoted and 10 more who were not; and, a variety of statistical and analytical procedures.

Note that of the indicators considered to be of major value, all
are derived from inflated reports. Those indicators considered to be
of minor value are all candidates for an "either/or" weighted score.
And, finally, that the indicator that probably would have the greatest
potential variation--namely, time in combat--is considered to be of
negligible value in determining promotion potential. Thus, the inflated
nature of the OER complicates the establishment of an OML because the
inflated OER has its greatest effect on those performance indicators
which are considered to be most important.

Given the circumstances described thus far, it becomes patently
obvious that inflated efficiency reports are absolutely intolerable.
The situation cannot be ignored any longer. The Army must increasingly
make tougher and tougher decisions as to who stays and who goes as the
size of the officer corps must be decreased at an even faster rate than
the end strength of the entire force. Therefore, order of merit listings
are becoming more important--not less so.

At this point I must digress slightly to discuss one proposed solu-
tion to the problem, which completely misses the heart of the matter. I
refer to those who, in effect, have given up on trying to cure the inflated
OER and, instead, propose the development and use of other "indicators."
These include use of the Graduate Records Exam (similar in design to the
SAT test used in our simple example above), proficiency tests, and the
Army Language Test. This approach would be akin to a football coach
allowing his assistants to rate all of the players as "outstanding" and
then allowing the weight of the decision as to who should start at

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defensive end to be based on how articulate his players are as measured by a written test. The coach needs a defensive end who can hit--not one who indicates most articulately that he understands how the position should be played.

Quite simply, if a coach wants to win on Saturday, he's got to pick the players who can hit on the Monday before the game. So, too, with the Army. The OER is the device by which leaders either explicitly or implicitly indicate how well their subordinates can hit. It is the primary vehicle by which the nature and character of the future leadership of the Army is determined. We can't afford to mask its effect without running the danger of elevating the wrong individuals to the highest levels of leadership. One can conjure up disturbing visions of the future where more urbane and sophisticated counterparts of General MacAuliffe (who said "Nuts" at Bastogne) surrender their position because the probabilities of a successful defense are against them.

If inflated efficiency reports are so dangerous, then why do we continue to tolerate them and who is responsible? The answer is we all are and that some of the worst offenders would have to be general officers. It's really not surprising. They, after all, are the most perceptive and more fully understand the "one strike and you're out" syndrome built into the present system. Furthermore, they reason that by virtue of having placed what they consider to be outstanding officers in key positions around them, they are obligated to look after them and to reward them for the oftentimes heavy stresses and almost impossible hours which they must work. All of us, but especially the generals, are aware that anything

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short of a very inflated rating may be something from which a good officer can never recover.

A good part of the problem lies in the fact that there is no simple, easily administered system in effect today by which the inflation can be curbed. The only things that appear to have been tried have been switching to new OER forms and blanket exhortations to us all to stop inflating. Both methods are becoming less effective--the former because too many are already aware of the need to inflate in order to stay even and the latter because the exhortation itself advertises the fact that inflation is indeed a fact. Lastly, those in the Officer Personnel Directorate (OPD) who are in a position to evaluate incoming OERs are hardly in a position to send some of them back on the grounds that they are higher than average. OPD is just not in a position to respond to a rater or indorser--especially if he is a three or four star general--who states that his group of rated officers are part of a highly important headquarters that has been staffed by outstanding officers.

Yet inflation can be stopped. All the Chief of Staff of the Army needs to do is announce that all raters will maintain an 80 average on all the captains they rate. That means that you and I must individually carry an 80 average on all the captains we rate throughout our military careers. The only way we can give a captain an 81 is to give another captain a 79. Wait, don't scoff! Think about this for a minute. The fact that I've arbitrarily picked the number 80 and rank of captain is for illustrative purposes only. A better number for each rank can be worked out. That's no problem. However, what the arbitrary selection

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of a fixed average rating does is make it very easy to control inflation. An action officer in OPD can routinely return an OER to a rater if it is too high (regardless of the rank of the rater) because, after all, the determination by the action officer in OPD is administrative, not evaluative, and the rater cannot argue the point.

Think for a moment about the psychology of this new approach. Most of us would try to maintain a rating average slightly less than 80, thereby giving us the capability of giving anything up to and including 100 to a captain whom we consider to be truly outstanding. Remember, our rating average will be a lifetime average. Hence, if we have rated 50 captains and our average is exactly 79, then we will have 50 points stashed away to apply to those captains who, in the future, really do a superb job.*

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*We might want to start the new system by giving all raters some beginning number of surplus points just so those who are initially rated are not hurt. In the illustrative example below, all potential raters and indorsers start off with a 79 average based on their having evaluated 19 captains.

Initial (Artificial) Status of Rater or Indorser

- A. Maximum allowable average = 80
- B. Rating average (artificial) = 79
- C. Number rated (artificial) = 19
- D. Maximum points (A x C) = 80 x 19 = 1520
- E. Raters points (B x C) = 79 x 19 = 1501
- F. Surplus points (D - E) = 1520 - 1501 = 19

Status of Rater or Indorser After Giving an 85 to the First Captain He Evaluates

- G. Number now rated = (C + 1) = 19 + 1 = 20
- H. Maximum allowable points = (A x G) = 80 x 20 = 1600
- I. Raters points (E + 85) = 1501 + 85 = 1586
- J. Raters new average = (I ÷ G) = 1586 ÷ 20 = 79.3
- K. Surplus points remaining (H - I) = 1600 - 1586 = 14

Secondly, the phrase "it's not what job you have but how well you do it" will take on new credibility and meaning. The numerical rating you get as a staff officer in a division headquarters should carry just as much weight in matters dealing with merit as a numerical rating received in a more prestigious headquarters. In short, the new approach should discourage "ticket punching" and the idea that being stuck in one job will hurt chances for early schooling or for promotion. Furthermore, it should assist in spreading the talent. An officer can stick to doing the kind of work he likes and does best without being concerned about the fact that he "hasn't been to Washington yet" and the like. In this regard the system would facilitate the credibility and acceptance of the Officer Personnel Management System (OPMS).

Our present computer capability appears to be such that it should be relatively simple to publish annually each officer's lifetime rating average for each grade level he has rated. Perhaps it could be published in conjunction with the Officers Register. This would serve two purposes. First, public listing of rater averages would help to increase uniformity and to deflate ratings. Each rater would have to appear to have extra bonus points in order to encourage the outstanding officers to seek assignments under him. Similarly, he would not want his ratings to become too low for fear of discouraging promising officers from seeking assignments with him. Secondly, published rater averages would allow personnel managers in OPD to do a better job of drawing up order of merit lists by factoring the ratings from those who rate a little over or way below the average. Thus, they would achieve a closer comparison of how two

officers in similar jobs in two different parts of the world actually performed their jobs. Also, the ability to normalize rated manners of performance in different types of assignments (command, staff, instructor, etc.) would facilitate the evaluation of each officer's potential under the various options open to him under OPMS.

Finally, those who are involved with the problems of distribution of officers worldwide would have a powerful tool for more precisely assigning officer quality according to priorities set by the Chief of Staff. Each command's quota (by quintile) can be matched against officers actually assigned to develop a highly visible report for insuring that policy guidance from the top is being followed at the operating level.

In summary, most of us understand that inflated efficiency ratings, which must in each case be judged against a standard of performance that keeps changing upward, are not good. We agree that something must be done. Yet, after years of trying to change people's attitudes, we still haven't figured out that to effectively do so we must take direct steps which affect behavior. The system I propose doesn't exhort officers to somehow collectively agree to stop inflating OERs. It absolutely precludes inflation. In my view, the problem is becoming so serious that a system such as the one I propose, which works on the behavior of the rating officer rather than on his attitude, should be adopted--and soon.

WHAT WE ARE TO BE AND WHAT WE ARE TO DO

Marc A. Moore
Colonel, USMC

It has become a cyclical, historical event that the United States agonizes over the role of its military forces after a period of warfare. There is always much reflection by civilian leaders on the expense of maintaining a military force once the guns have fallen silent, as domestic priorities become up-graded, and the nation turns toward internal issues rather than foreign affairs. There is soul-searching among the armed forces also as the military performances during the past war are evaluated and concepts are examined as to what roles the armed forces may be called upon to carry out in the future.

The cycle after each war has followed the same general pattern. Once hostilities have ceased and large military forces have been reduced in number, the phenomenon unfolds. Civilian leaders commence fiscal reductions which reduce the size of the armed forces. The military launches a program of drawing the armed forces closer to the societal values of the civilian community, "humanizing" its traditions to bring itself more in concert with the nation's mainstream. As the post war period continues, the civilian leadership steadily reduces the armed forces and the historical attitude of the American people slowly discounts the military as an integral part of a peacetime society. The military then turns away, withdrawing in upon itself, restructuring its own codes of professional ethics. Drastically reduced in strength, the military trains its shrunken cadres and awaits the next call to arms.

The American military and its civilian masters are once again at the

classical crossroads of the post-war re-agonizing. Detente, raproachment, multipolarity and balances of power, are songs heard on the winds of change. There is no longer a military draft.

Although there is an increasing call from the civilian community for reduced military spending, unlike the past, the United States still has world-wide commitments that require creditable strategic and general purpose forces. As the military and civilian leadership enter into a new cycle of selective commitment under the Nixon Doctrine, the momentum has commenced to curtail military spending. The armed forces are reducing in numbers and equipment as the cost for both rises. As the draft has ended, the classical military process has started to "humanize", to draw closer to American civilian societal values in order that the services will be more appealing for an all volunteer force.

The military professional sees conflicting currents flowing and ebbing about him. He has been directed to maintain readiness and fullfill world - wide commitments with two million volunteers, the largest all-volunteer force ever attempted in the history of arms. With force reductions still continuing and the mission of the armed forces not reduced in scope, the military professional may well ask his master - the civilian community of the nation, two key questions:

What is it you want us to do? What is it you want us to be?

Although many in the civilian community can find fault with the military and are often quick to vocalize negative aspects of the armed forces, few offer specific recommendations on what the military establishment should be.

The U.S. citizenry still looks to the military professionals to set the course for the armed forces role in the nation's society. The only guidance presently received from the civilian leadership is fiscal restraint, particularly on weapons systems, and the military is to be an all-volunteer force.

The military has traditionally approached a period of change, or refurbishing, by re-evaluating its precepts for existence - its martial ethos - military professionalism. From this focal point the military has in the past faced two conceptual approaches to the development of its institutional role.

The central, fundamental issue at this point in American military history is this: will the traditional concepts of military professionalism and the two approaches of the past provide viable solutions to the military challanges of the next few decades? Let's first examine the two traditional approaches, then analyze the basic keystone, military professionalism.

THE HUNTINGTONIAN APPROACH

Some writers believe the blueprint for a future U.S. Military is found in the Post-World-War I model described by Huntington in his book, The Soldier and the State. Huntington described how, by the 1920's, America's projection of a period of extended peace and its isolation policy had resulted in branding the military as inefficent and unnecessary "and there was nothing for the military to do but to retreat back to their prewar isolation and find interest and satisfaction in the mundane duties of their profession." Huntington and others believe withdrawal and isolation of the military provides a contemplative time to develop and re-hone military professionalism. The prominent

American military leaders of World War II are often given as examples of this isolated, professional development period of the 1920's and 30's.

Some conceptualists see this phenomenon taking place again during the present spirit of detente, SALT and MFR discussions. Such a withdrawal into a monastic, contemplative shell supposedly would enable the military to refurbish soldierly ethics and muse over the tactics and strategy to be employed when the call to arms sounds again.

THE JANOWITZIAN APPROACH

There is another school of thought, or conceptual approach, on how the military should mold itself and its leadership in the decades ahead. This approach is on an opposite course from the "Huntingtonian approach" described above. This as the "Janowitzian approach", after Morris Janowitz the sociologist who has written extensively on socialization patterns in the military.

This school of thought also is a historical phenomenon in American military history where the military is proposed as a reflection of the society it represents. In this interpretation, the armed forces in a democracy should reflect the social values of its constituency and the service, to a large extent, should base its organizational approach on the civilian society's sociological and psychological precepts. This school of thought has strong appeal today as a motivating incentive for recruitment into the all volunteer force. Leadership and discipline are thought of in terms of, cooperative spirit, self-perceptions, actualization of motivational goals, etc.

Some conceptualists envision a major reorganization of military forces on this behavioral science model such as described by Richard F. Rosser in the

Fall 1973 issue of <u>Foreign Policy</u>. In his article, "A 20th Century Military Force", Rosser states the present armed forces are not of this century; that aspects of the military structure and life style date back from the second century B.C. to the last century. He states the military is out of tune with the changes of modern society and "we see everywhere within the American military of attempts to pursue isolation from society to avoid change."

Rosser proposes an armed force structure similar to the large corporation model. There would be specialists and generalists functions and branches, with the combat arms branches more remodeled on the authoritarian, soldierly ethic, but with specialist branches much more permissive. The garrison environment would be eleminated to avoid separate living facilities that tend to develop a separate "military culture." Rosser, as do the other Janowitzians, sincerely believes the American military cannot survive in an all volunteer environment during the coming decade if it isolates itself into the separate soldierly culture the Huntingtonians seek.

Thus, we have two divergent approaches to the questions of the role and composition of the American military in the coming decades. Despite their different positions, both the camps of Huntington and Janowitz call upon the military professional to set matters right. It is the military professional who must set the forces in motion to mold the military posture for the future. The civilian conceptualist can write about it, and the civilian governmental leaders can approve the plan, but it is the professional military leader who must formulate, pro-pose, and execute the necessary actions.

Some critics believe the military leadership has become so bureaucratic

in the past 30 years with a "zero mistake", "no-criticism", environment that no creative change or response to challange can be instituted. This question of the military leaders' professionalism is the classical phenomenon that surfaces after every war in American history. It is an intregal variable to the "isolate-and-turn-inward" and the "humanize-and-go-public" equation.

The issues described so far can be traced back to the writings of Hammurabi of Babylon in the twenty-second century before Christ where the functions and problems of the professional military leader were touched upon. The question of employment of the professional military force after a war has been resolved throughout history - each solution commensurate with the spirit of the particular times. So it will be in this period in our nation's military history.

To propose an answer to the questions, "What are we going to be?" and "What are we going to do?", we should start at the base point. That base point is to define exactly what we are pursuing as an ideal - what are the ramifi-cations of the term, "the military professional" or "the professional soldier"? What are the implications in the term, "professionalism?" Once these inter-pretations are identified and sought as objectives, the question of "what we are going to be" is answered. When "what we are going to be", is solved, then "what we are going to do" is easily approached.

THE MILITARY PROFESSIONAL

To start at point zero, a "professional" can simply be identified as a person participating in an activity for gain or livlehood in an activity often engaged in by amateurs. "Professionalism" is defined in Merriam-Webster as "the con-duct, aims or qualities that characterize or mark a profession or a professional

person." The key words are, of course, "conduct","aims" and"qualities".

The professional military person has always identified with excellence and a high standard of knowledge and application of that knowledge. He strives for it in his personal conduct and expects and encourages it in his associates; senior, contemporary, and subordinate in rank or position.

Since the military is a people/things organism, the professional never ceases to obtain better comprehension on how to most effectively, and excellently employ the "things" of his profession; weapon systems, logistic structures, tactical, and strategic concepts. Concurrently, and most important, military professionalism implies a striving for mastering the technique of the "people" portion of the military organization.

The material systems, structures, and concepts constantly change in the military profession, whereas human nature does not. The military professional has the tendency to gain mastery of the material requirements and take the human part of the military for granted with often less than the full abiding interest in all aspects of human wellfare that the truly responsible military professional must display.

This last point is the ethic that must be emphasized in the military pro-fessional definition during this and the coming decades. The misconception of this ethic that has been passed down to us is the answer to the following question: "Who are the military professionals?" Almost to a man all the conceptual military writers, including Janowitz, and especially Huntington, tell us it is the officer corps.

Why is the officer corps considered "military professional" and the enlisted, non-commissioned ranks excluded? In The Soldier and the State, Huntington indicates,

"-the difference between the career enlisted man who is professional in the sense of one who works for monetary gain and the career officer who is professional in the very different sense of one who pursues a 'higher calling' in the service of society."

This particular ethic is an anachronism that dates back to the previously described Babylonian military structure of 2200B.C. where a professional military leader group was kept on the payrole to lead the levy drawn up in time of war. Traditionally throughout the history of arms the officer corps has come from those classes of the aristocracy who had more education. In the American military tradition, advanced education has been a prerequsite for the officer corps so as to develop leadership with ever greater responsibilities in the enhancement of national security. But it is a false, organizationally debilitating value to perpetuate the premise that the officer corps is the only "professional" group in the military which serves the nation for some "higher calling" other than pay and job security.

This ethic is insulting to the exemplary corps of non-commissioned officers who pursue critical and valued positions in the military structure - many with a professional creed much more lofty and worthy than those of some members of the officer corps. There is no argument with the fact that the officer with his better education and progressing additional scope of responsibilities throughout his career is called upon to make decisions and conceptualize ideas that may effect the course of the military and the nation. However, the enlisted professional, with everwidening opportunities for self-learning and additional ed-

ucation in the service, must be just as militarily professional in the implemen-

tation of his superiors' decisions if the military is to be a creditable factor in

the security of the United States.

The military professional must therefore be defined in the context of

this decade as being any person who voluntarily contracts to serve in the armed

forces whether for three or thirty years. Each individual should be made

fully aware of the high standards of excellence in assignment performance,

self-improvement objectives, moral courage, and personal example expected

of any military professional no matter what the rank or duty might be. Not only

should the individual be made aware of the professional goals, but he should

constantly be expected to adhere to them.

This interpretation of military professionalism may be viewed by critics

as "Neo-Jeffersonian liberalism" somewhere to the left of Huntington's "Neo-

Hamiltonians" who attempted to bridge civilian and military ethical values.

Actually, the proposed interpretation is eclectic. The interpretation of military

professionalism transcending all ranks is intended to levy personal accounta-

bility of performance on the rank and file. It is no great revelation that a unit's

effectiveness will be enhanced if each individual perceives he is responsible

within his limited position for the success of his organization's accomplishing

its objectives.

WHAT TO BE AND WHAT TO DO

The issue is not whether the military will swing to the extremes of the

Janowitzian or Huntingtonian approach if the proposed professional interpre-

tation is followed. As long as the civilian leadership of the nation maintains a

sizeable armed force consisting entirely of volunteers, second to none, serving as a international deterrance force, then neither the Huntington or Janowitz models will apply.

If the nation's leaders withdraw to a fortress America, forgoing our existing alliances, and accepting by default the military superiority of the Soviet Union, then the military could withdraw within itself, isolated, and nursing its classical interpretations of military professionalism. Unfortunately, the 1930's model wouldn't help much. Unlike the spartan professional nucleus that had time to mobilize into the massive military machine of World War II, if war comes in this decade with our presently perceived chief adversary, it would be "a terrible swift sword" and our highly educated, military professional officer corps wouldn't even have time to canter in off the polo fields.

In the other model where the social scientists, corporate management engineer, and democratic humanist would prevail, then the armed forces might become a social betterment institute where, in order to ensure a popular response to the all volunteer environment, extensive social uplift programs, and skill enhancement programs would hold sway over combat training, discipline, and readiness. Participatory management, the informal group structure, and consensus excercises in arriving at production goals are fine for the campus or corporation, but not for an organization which must close with a determined enemy and defeat him in combat. The sterile, air conditioned, sensor and laser electronic battlefield is not just over the horizan.

Let us proceed on the assumption that this nation will continue its role of international responsibility and leadership in the decades ahead. Let's

also assume that we wish to reinforce that world role with creditable strategic

and general purpose forces composed of volunteers who are capable and ready

to quickly respond when called upon. Such forces should have certain fundamental

qualities. These forces must be imbued with a pride in their individual units

and a pride in their individuals within those units. Each member of those forces

must believe that his unit functions successfully due in part to his own profess-

ional abilities. This spirit of individual and unit pride is reflected in the high

degree of unit and individual proficiency in its tasks, the appearance of indivi-

duals, and in their working and living areas. The self-esteem and competence

is reflected in the discipline structure - prompt obedience or response based

on established mutual respect for professional and personal qualities.

The armed forces are perceived as effective by a potential adversary and

act as a deterrant when the adversary sees this proficiency demonstrated.

These demonstrations take the form of force exercises, readiness reaction drills,

prescence forces operations, and deportment of servicemen on off duty hours

on leave and liberty, particularly in foreign lands.

Thus, the proposed answers to the questions posed at the outset are now

laid out. "What do you want us to be?" A viable armed forces with a deep sense

of military professionalism permeating all ranks. Personnel who will feel valued

and satisfied as becoming better individuals because they have served in a

worthwhile endeavor; whether for three years or thirty. This would be a

military professional force that neither sulks in the barracks nor votes on

courses of action in the barracks court yard.

"What do you want us to do?" Maintain an armed force that is ready, capable,

and proud to do its duty; be highly proficient in accomplishing assigned objectives; deploy and display these qualities to a potential adversary periodically.

At this point the reader may well sigh and conclude he has just labored through someone re-inventing the wheel. Not really, this was an attempt to put back a hub-nut that was either thrown off our war chariot's wheel some time ago or never got put on before the chariot was to sally forth. That hub-nut is dispelling the perpetuated mythology that only the officer corps are the military professionals, and that the military must become either isolated or liberalized after a war.

There is no one key to building a viable, competent armed force. But a basic precept that will enhance a unit and build a system of effective units is the reinforcement of an individual's positive self image within the unit. If all ranks in the military understand they are military professionals and are <u>truly expected to meet those standards</u> at all times, then we will truly and proudly know what we are to be and what we are to do.

ADAPTIVE SYSTEMS CONCEPTS AND
THEIR APPLICATION TO STRATEGIC PLANNING

> For strategic thinking, or "theory" if one prefers,
> is nothing if not pragmatic. Strategy is a "how to do
> it" study, a guide for accomplishing something and doing
> it efficiently. The question that matters in strategy--
> as in many other branches of politics--is, will the idea
> work?
>
> Bernard Brodie

Introduction

For the past 15 years, much attention has been devoted to the Planning,

Programming, and Budgeting System (PPBS). The concept of PPBS has been

articulated at length and implemented in the Department of Defense. Basi-

cally, PPBS bridges the gap between a perceived threat and a limited budget

through the activity of programming. The output of the PPB system is an

objective force. Far less attention has been given to explicitly linking

the objective force level as an input with a combat output. This essay

takes the view that because the relationship between tactical combat per-

formance and strategic force level planning is not included, the PPB model

is incomplete. National security cannot be advocated effectively before

the Congress under the present system as long as force level impact on

combat effectiveness is relatively unknown. Force level planning at best

addresses an uncertain future. Current cybernetic and adaptive system

modeling concepts can aid in resolving this uncertainty.

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A recent publication (Tugwell, 1973) described four types of thinking in planning toward an uncertain future. Normative thinking includes answering the difficult question, "What goals are correct?" Scientific thinking attempts to explain behavior with generalities that can predict. Futurist thinking looks at alternatives and seeks to discover both what is possible and what is probable. Finally, strategic thinking determines how to achieve desired outcomes. This paper is primarily concerned with strategic thinking and the use of adaptive systems concepts in order to model for the achievement of desired goals.

The normative task of value judgments is that of an array of leadership produced by a democratic society. This leadership must be mindful of the admonition provided by Chester Bowles as he appraised the US Government in 1961:

> The question which concerns me most about this new Administration is whether it lacks a genuine sense of conviction about what is right and what is wrong. (Halberstam, 1972).

The ends-means tension is a clear danger for normative decisionmaking and implementation. It is quite possible to become so focused on an objective and its pragmatic worth that morality, while pursuing and achieving the objective, becomes obscured.

Recent scientific thought linking the environment with determining predictable human behavior has been addressed by B. F. Skinner:

> In the scientific picture a person is shaped by evolutionary contingencies of survival, displaying behavioral pressures which bring him under control of the environment in which he lives, and largely under the control of a social environment which he and millions of others like him have constructed and maintained during the evolution of a culture (1971).

Skinner's arguments on the environmental control of individuals are
compelling, but there must be some linkage to the value judgments of
normative thought. The requisite value judgments can be viewed as man-
kind's great curse or blessing. However, it is useful to pay heed to
the suggestion of Dr. Rollo May, "Whenever control is more important than
the values that guide the control, then you have totalitarianism."

As far as _futurist_ thinking is concerned, some agree with Stafford
Beer (1973) that:

> In the first place I do not believe that we can
> forecast the future--and that is a fairly strong
> objection. The future, I reckon, is known only
> to God. . . .

However, Beer does support the idea that a strategic methodology can be
developed which guides a society toward planned objectives.

Approaches To Strategic Planning

Models are needed that can describe behavior directed toward norma-
tive goals. The question succinctly stated is as follows: are there
models that can link information, resource allocation, and goal achieve-
ment? In a management by objectives milieu, such models would be of great
use. Processes and approaches have been developed in the past that deal
with the allocation of scarce resources to meet objectives and some are
still in use. The planning, programming, and budgeting system is a
strategic methodology for resource management. The objective is to obtain
with some precision the forces required to meet the perceived threat.
PPBS is in fact a process which rationalizes a logical way to go about
resource management at the planning levels of the Service staffs, the

Joint Staff, and the Office of the Secretary of Defense. While PPBS is useful as a systematic way to go about high-level decisionmaking, it does not provide a methodology for testing various force levels to make certain that the objective force <u>inputs</u> are adequate to accomplish the required combat task <u>output</u>. In fact, the PPB system is structured in the reverse, with a strategic objective plan <u>input</u>, budget constraints, and a force level <u>output</u>. There are no satisfactory measures to provide either military commanders or Congress with information that the forces in being or programmed are adequate to accomplish a defined combat task. If the United States Government desires to maintain security with an adequate combat capability at minimum cost, then the combat output must be explicitly linked to the force level input. The result of the present process is that the issue of combat output is not argued effectively or knowledgeably in the struggle for force level funds.* This is not because of incompetency or purposeful misleading testimony but largely because the impact of strategic force levels on a defined combat task is unknown except within very broad limits. There is some evidence that the budgeting process has in practice become disassociated from the objectives plan. and can perhaps best be described as bureaucratic bargaining or "muddling through." Lindblom made this terminology part of the decisionmaking lexicon in 1959. The idea is that bureaucratic decisionmaking is not goal oriented but rather incremental. Each year a given department asks predictably for a little bit more; not with a specific output in mind but

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*This issue is argued, to a point, for individual weapon systems as the requirement for operational capability (ROC) is part of the weapon system acquisition process. However, this essay is looking at force levels in total.

with the conviction that more is better and a little bit more is politically enough. Policy is thus adaptive marginally in one direction, upward, and cannot respond dynamically to a brand new environment such as a rapidly increasing conventional threat and emerging domestic imperatives. The best solution to this budgetary bargaining trap of incrementalism is to be able to advocate, with candor, strategic force levels as inputs in terms of defined combat objective outputs. The modeling problem is twofold: (1) Model the tactical level of combat in order to relate combat effectiveness and resources. (2) Model the hierarchical levels of a defense system to link Service staff force level acquisition decisions with the use of resources at the tactical level. This model should be able to function during actual operations as well as test force level adequacy prior to implementation. PPBS is at best a rational process model and the predictive capability of the incremental model can be characterized by short-term accuracy. The incremental model predicts the arms race--more, and weapon system acquisition--higher and faster. However, the incremental model is unable to cope with significant departures from the status quo or with a concept of limits. The above issues are the primary concerns of the strategic planner.

What is called for then are models that can test effective behavior and tie this behavior into resource acquisition. These models are not based on what an individual unit claims it will do (the questionnaire bias) or even rational behavior (an assumption of optimization). Rational behavior requires knowledge of all the alternatives, the ability to rank order the alternatives, and the selection of the best alternative. This

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situation rarely, if ever, exists in the real world including particularly

the uncertain environment of combat. The suggested models have at their

base actual behavior and a concept of adaptive behavior. The approach taken

in this paper to explain the models is first to define the adaptive concept

and to explain the elements of the models. Examples include the patient-

nurse-doctor triad in health systems and the aircraft as a man-machine system.

Finally, the models are evaluated with regard to their relevance, feasibil-

ity, and utility through an analysis of current efforts in the areas of

naval tactics and economics.

Adaptive Systems Concepts

An adaptive system view of modeling uses certain cybernetic techniques.

Tugwell (1973) has this to say about cybernetics:

> There seems to be growing consensus that the really
> catalytic development of tne new era we are entering
> lies in the realm of information control and organi-
> zation, and in the emergence of extremely efficient,
> rapid, and complex cybernetic systems--self-conscious
> learning--steering networks. Unlike the earlier
> agricultural and industrial revolutions which involved
> the extension of man's physical power over nature
> through the harnessing of first animate and then inani-
> mate energy sources, the current transition seems to
> involve an extension of man's mental power, his knowing
> and perceiving abilities.

Systems thought has progressed from the input, process, output paradigm to

a more dynamic perspective. This perspective can be gained from the funda-

mental definition of a system--a set of interdependent parts. Now this

interdependency exists in at least two ways: hierarchically (the vertical

dimension) and functionally (the horizontal dimension) at a given level of

the system. An example of hierarchical interdependence is the Department

of Defense, United States Air Force, Strategic Air Command, 17th Bomb Wing,

and weapon system B-52H. There is also functional interdependence at a given level of the system. For example, when a B-52 is in flight, there is interdependence among the functions provided by the flight controls, the fuel lines, the pitot-static instruments, and importantly, the regulator function as represented by a pilot controlled input. The two models under consideration in this paper represent these aspects of interdependency. One relates hierarchical levels and the other addresses functional interdependence at one level of a system.

The notion of adaptive behavior is appropriate to both the systems models, multi-level and single-level. The adaptive systems concept centers on the objective of survival which is dependent upon the dynamic stability of interdependent essential variables and the use of information feedback and limited resources to provide the requisite stability in a changing external and internal environment. One of the best ways to describe adaptive behavior is to focus on each element of the definition, thus providing the reader with a glossary. The elements: (1) the objective, (2) survival, (3) dynamic stability, (4) essential variables, (5) information feedback, (6) limited resources, and (7) a changing internal and external environment.

The adaptive behavior of complex systems is goal-directed and not random; it is learned and not reflexive. Goal-directed and learned behavior patterns are necessary to the model. The model adapts by measuring the difference between actual and ideal behavior as it progresses toward a defined goal. Using this difference or error, the system is able to learn behavior that permits its survival as it pursues a defined goal. In this context the encompassing objective, and in fact the criterion of success, can be

said to be survival. This notion is useful as behavior is observed and measured over time and not simply based on whether a defined goal is accomplished.

The continuing objective is said to be <u>survival</u>. Interdependence was discussed as functional (single-level) and hierarchical (multi-level). Survival can be discussed in the same framework. At a single level of a system, survival is necessary on a goal-directed basis. Clearly, goal accomplishment is impossible if the system does not survive enroute, for example a bomber's approach to a target. Looking at the multi-level system, one common objective of large complex systems whether they are nation-states, corporations, or military organizations is their survival. Survival is a base line objective and has great and perhaps dominating influence on a system's behavior. Behavior can be analyzed with this in mind, i.e., a nation-state's vital interest in certain raw materials or a corporation's product diversification program. Lower level systems (a military unit) may in fact be sacrificed to permit the total system's survival. However, the sacrifice of this lower level system is in vain and dysfunctional if its defined goal was not accomplished.

<u>Dynamic stability</u> means stability continuing over time. Dynamic stability links the survival objective with a concept of limits. Basically, if a system exceeds its limits, it becomes unstable and fails in its goal-directed pursuit. This is a homeostatic concept (Cannon, 1932) that relates biology and systems theory. The human body has certain essential variables such as temperature and blood pressure that must stay within defined limits if the physical system is to survive. The capability of any system to

continuously stay within limits is known as dynamic stability.

Essential variables help define dynamic stability with more precision. These are variables

> . . . which are closely related to survival and which
> are closely linked dynamically so that marked changes
> in any one leads sooner or later to marked changes in
> the others (Ashby, 1960).

Examples in a biological system include pulse rate, respiration rate, and temperature. Some essential variables of an aircraft are airspeed and rates of climb and descent. Thus, these essential variables have definable limits and are closely related to each other, the stability of the system and, in the final analysis, the system's survival.

Information feedback is needed to let the system know the state of its essential variables. These variables are not constant values but they do have a band width that defines their stability. The human body can withstand a certain range of temperatures and the airborne aircraft must keep its airspeed between stall and disintegration speeds. In order to remain stable, the system must recognize generally whether or not the essential variables are within limits and specifically what the values of the essential variables are. The system gains this knowledge by information feedback.

Now with knowledge of the system's state through information feedback the system must be able to respond to impending instability. This response is through the allocation of scarce resources. The allocation process is necessary because resources are indeed scarce. The human body has a continuous demand for food, the aircraft has a similar demand for fuel, and an industrialized economy has a demand for raw materials. There is a certain self-sufficiency within the system: body fat, internal fuel tanks, the

nation's natural resources, but invariably this supply is limited. Thus, resources must be acquired and allocated from both within the system and, importantly, from outside the system even when the system is as large as a nation-state. Resources are allocated in response to information feedback. This feedback indicates differences between the ideal value of an essential variable and the actual value, requiring, to resolve the difference, the use of a resource. In order to maintain aircraft stability when the desired (ideal) airspeed is higher than the indicated (actual) airspeed, power (a resource) is added to keep the airspeed variable within limits. Survival of a system can be defined as occurring, ". . . when a line of behavior takes no essential variable outside given limits (Ashby, 1960)."

The reason the adaptive system line of reasoning is necessary and the model provides some needed insights is because of a <u>changing internal and external environment</u>. If the environment was constant, resource allocation could be linear and dynamic stability would not be a problem. But the connotation of dynamic includes both the dimensions of time and change. Complex systems must deal with change in their internal and external environments. Within the system, an airborne aircraft must adapt to changes in the aircraft's configuration such as lowering the landing gear or possibly the incapacitation of the pilot. A nation-state must adapt to a domestic energy shortage and environmentalist's concerns. Regarding the external environment, the aircraft flies through various weather patterns; the nation is challenged by another state's expansionistic foreign policy. The consequence of non-adaptive behavior is instability and subsequent system failure.

A Single Level Model

The use of adaptive systems concepts is best expressed in models. A typical cybernetic model and one that has been used in significant adaptive systems research was developed by Professor Daniel Howland of the Ohio State University. It should be noted that this model deals with a single level and describes functional interdependence. A multi-level hierarchical model is presented later in the paper.

This single level model (Figure 1) is referred to by Howland, Colson, and McLean (1973) as a structural model. The model is open to the external environment and also contains a closed loop which means it depends on information feedback. The model has been used to represent the behavior of health systems (Howland, 1970) and the aircraft as a man-machine system (Shaud, 1973). The paper's approach to discussing the model is to define the components in terms of the health system and then describe the information flow using an aircraft problem. The components of the model function as follows: The state processor is an information source. In the health system, it represents the patient abstracted as a set of essential or performance variables (Y): for example, temperature and blood pressure, that must be kept within limits if the patient is to survive. The state processor also represents the resources (X) such as drugs being applied to keep the essential variables within limits and the environment (θ) which could include the room temperature. The monitor observes and measures the information provided by the state processor. Importantly, the monitor captures this information continuously over time. The information is then sent on the controller and the comparator. The controller establishes the limits for the essential variables. It is aided in this task by a memory which
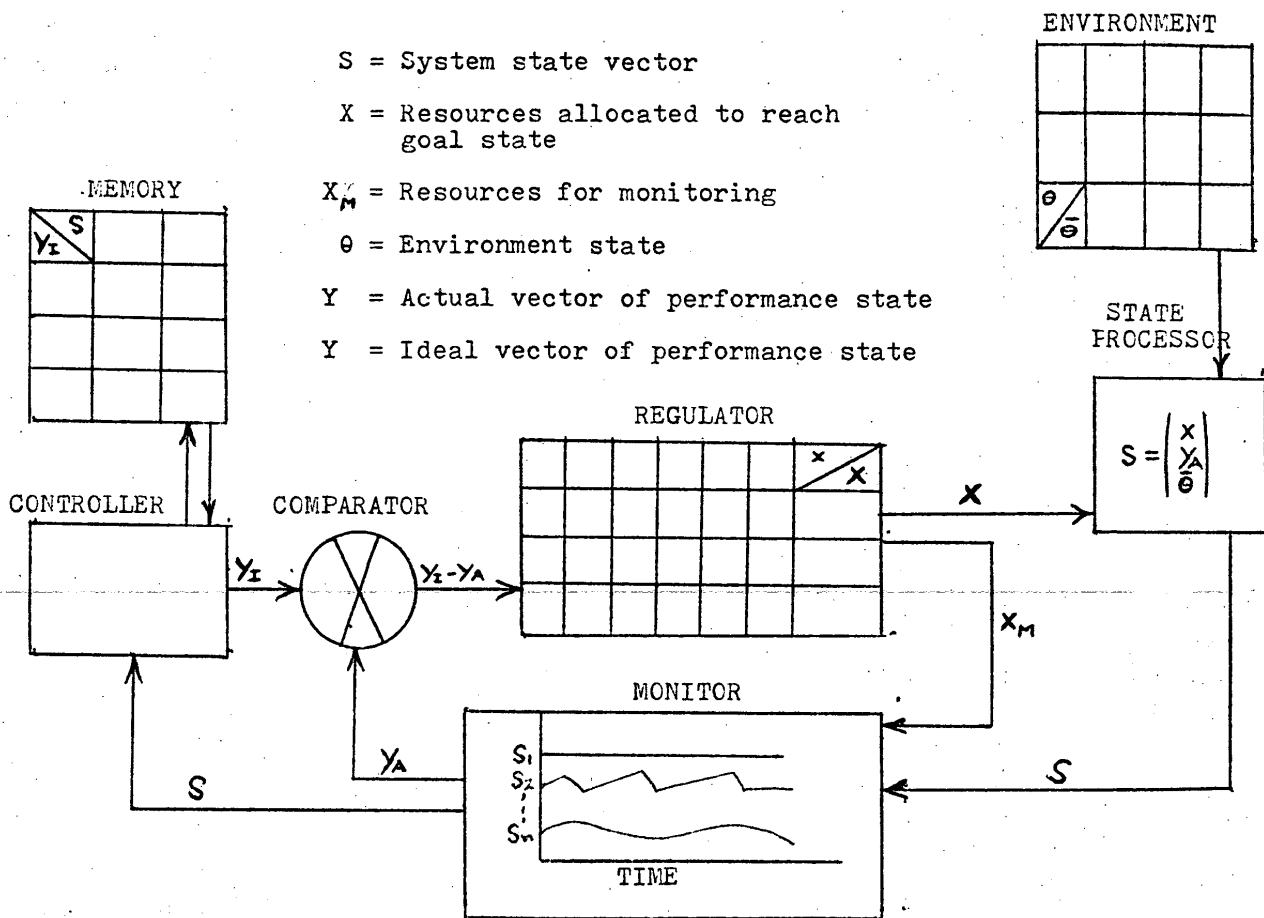
ENVIRONMENT

S = System state vector

X = Resources allocated to reach
goal state

X_M = Resources for monitoring

θ = Environment state

Y = Actual vector of performance state

Y = Ideal vector of performance state

MEMORY

STATE
PROCESSOR

REGULATOR

$$S = \begin{pmatrix} X \\ Y_A \\ \theta \end{pmatrix}$$

CONTROLLER   COMPARATOR

Y_I $Y_I - Y_A$ X

X_M

MONITOR

S

Y_A

S

S_1
S_2
S_n

TIME

Fig. 1 --Single-level model (Howland, Colson, McLean, 1973)

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records and recalls experience data from prior response to disturbances. The comparator then determines the difference or error between the actual state of the essential variables and the desired state specified by the controller. This error information is forwarded to the regulator which allocates resources to keep the essential variables within limits. The environment is the source of disturbances which tends to drive the essential variables out of limits. These disturbances can originate inside or outside the system. In summary, the components of the model are system functions structured in such a way to represent behavior, adaptive behavior As Ashby (1956) points out "cybernetics . . . treats, not things but ways of behaving. It does not ask 'what is this thing?' but 'what does it do?'."

An individual could perform several system functions. A person that is controller, comparator, and regulator in a man-machine system is the pilot of an aircraft. The aircraft is an example of an adaptive system clearly dependent on dynamic stability for survival. In order to illustrate how the single level model describes adaptive behavior, consider an airborne aircraft. The plane is on final approach to land with a desired approach speed of 130 mph and a stalling speed of 110 mph. Thus, the lower stability/survival limit is well-defined. The model represents this situation with the state processor. In the aircraft, this is the pitot-static system that gathers information on the aircraft's essential performance variables including altitude, airspeed, and vertical velocity. Resource information is collected by fuel probes and engine servo-mechanisms. The external environment of gusty surface winds is impacting on the aircraft. The monitor in this system is the pilot's instrument panel. The use of resources is

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is reflected by the tachometers and other power instruments. In this example, the indicated airspeed reads 120 mph with a decreasing trend over time. The rate of descent and altitude are appropriate for the approach. The specific essential variable situation of 120 mph is forwarded in the controller which knows from its memory that the desired airspeed is 130 mph and the limiting speed is 110 mph. Due to the memory, the adaptive system does not need to learn through experiment every time the aircraft is on final approach that the aircraft becomes unstable at 110 mph. The comparator references the desired airspeed 130 mph with the actual airspeed 120 mph and passes this error information to the regulator. The regulator corrects this error through changing the amount of resource application. In this instance, power is applied to reverse the decreasing trend of the airspeed. The new state of the system with increased fuel flow and increasing airspeed is again sensed by the state processor and the information loop maintains its dynamic quality and its continuity. This then is a fairly simple illustration of the single-level cybernetic model. This level, known as the tactical unit level, represents the actuality of resource use in a hierarchical scheme and is obviously not limited to simply an incremental increase in the application of resources to cope with a disturbance.

The Multi-Level Model

In order to relate resource use, allocation, and acquisition, systems may be partitioned into tactical, operational, and strategic levels (Howland, 1970). The tactical level is the basic level of the system which was discussed in the preceding section. This is the level at which the system reacts through use of resources to particular environmental disturbances.

All other levels of the system are then responsive to the <u>actual performance</u> which takes place at the tactical unit level. The operational level <u>allocates</u> resources to various tactical units and must make allocation decisions among units based on the unit's <u>capability</u> to use the resources. The strategic level <u>acquires</u> resources based on the tactical units potentiality to meet a projected demand. The external environment is thus interacted with twice, by tactical use and strategic acquisition. In summary, all levels of a complex multi-level system such as the Department of Defense must be responsive to the activity which takes place at the tactical unit level. Two models are involved. The first is the cybernetic model of adaptive behavior at the tactical level. The second is the multi-level model which describes the interdependency that exists among levels. The major advantages of accomplishing this modeling task is to reduce counter-productive sub-optimization (Hitch, 1953) at any one level and focus the attention of strategic level planners on the tactical results of their decisions.

The multi-level mode (Figure 2) is referred to by Howland, Colson, and McLean (1973) as a hierarchical model. One approach to the rationalization of this modeling scheme is provided by a British cybernetician, Stafford Beer (1973). This essay in effect combines the schematic concept of Howland, et. al. and the rationalization of Beer with an orientation of defense resource management. The model indicates three levels of hierarchy: the level that acquires future forces, the level that allocates existing forces, and the level that is using force to perform the assigned task. The levels are interconnected with two loops. The information loop is open to all levels indicating the necessity for feedback throughout the
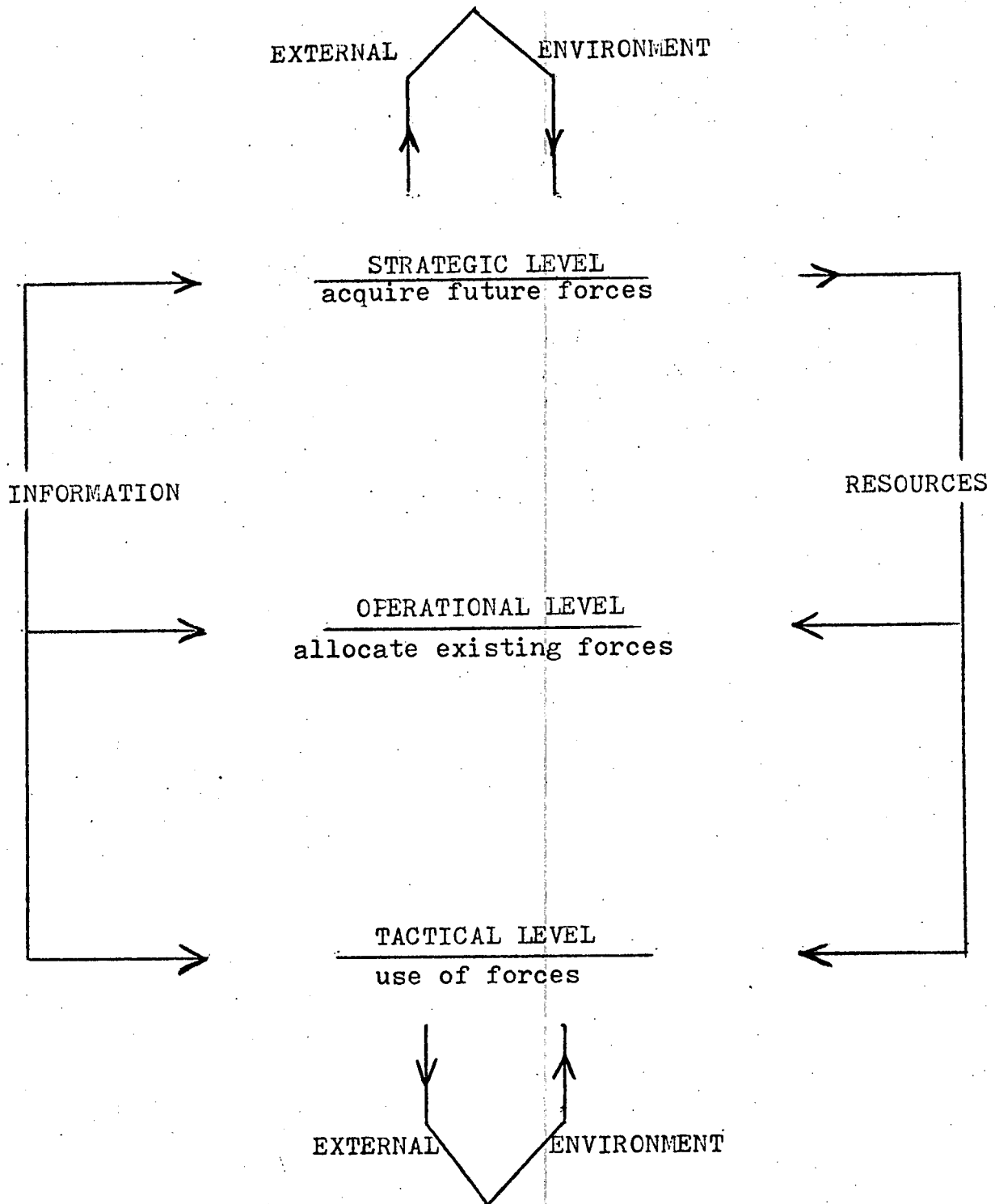
EXTERNAL   ENVIRONMENT

STRATEGIC LEVEL
acquire future forces

INFORMATION   RESOURCES

OPERATIONAL LEVEL
allocate existing forces

TACTICAL LEVEL
use of forces

EXTERNAL   ENVIRONMENT

Fig. 2 --Multi-level model
(Adapted from Howland, Colson, McLean, 1973)

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hierarchy in order to deal with the acquisition and distribution of resources. The resource loop progresses from the strategic level to each of the lower levels indicating the _acquisition_ source at the strategic level. The source of resources at the strategic level is connected with the _use_ of resources at the tactical level through an operational transition that can best be described as an _allocation_ process.

The key to this system is the usefulness of the information flow. The managerial information is based on a defined task objective at the tactical level. Management by objectives is critical to the model. With a defined objective, there are three measures taken. The first, using an output illustration, is _actual_ output, i.e., targets destroyed by a given strike force. The second is output _capability_ which recognizes the limitation of existing subsystems but assumes no aborts, no equipment failure enroute, or planned targets not attacked. The third is output _potential_ which assumes realistic relief of existing subsystem constraints. For example, a potential could assume all aircraft in a squadron are modified for an increased bomb load or even that an advanced weapon system is being used. These three measures can be taken of either resource variables such as manpower or performance variables such as attack altitude. What is significant is that each variable is necessary to the task accomplishment of the tactical unit. That means the variable can be related to the unit's goal directed behavior.

The success of the hierarchical model is dependent on the proper selection of variables at the tactical level. It is in this that the single-level cybernetic rationale discussed earlier is most useful. There must be a

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well-defined task requiring the expenditure of resources dependent on
information feedback to properly cope with a dynamic situation. An ex-
ample of this is the destruction of a highly defended target complex by
missile and bomber forces. The output variable is destroyed targets with
a great variety of resource and performance vaiables. This situation
could either be gamed or in existence as an actual operation. At least
two learning curves develop, one in response to defeating a dynamic de-
fense and the other reflecting successful target destruction. Possible
resource and performance variables are weapon system mix selection, aircrew
training, ordnance loading and attack sequencing. Resource and performance
variables that are essential to the desired output can be determined through
the tactical unit cybernetic model. If modifying a resource or performance
variable influenced the output while staying within the limitations demanded
by stability, then the essentiality of the variable has been determined.

In linking the tactical user with the strategic source through the
operational allocation process, the measures of potentiality, capability,
and actuality are again used. Potentiality relates to strategic planning
in order to select those essential variables for acquiring future forces
that most influence tactical output. Capability is important to operational
planning dealing with the best allocation of existing forces. Actuality is
most useful to the tactical commander as he adapts to the changing tactical
situation.

The multi-level model enables the defense organization to come to terms
with the following realities: (1) Decisionmaking must be decentralized to
permit the man with the best information to operate. (2) Control must be

centralized to prevent suboptimization. The measures of potentiality, capability, and actuality enable each level of the hierarchy to make decisions relative to their level--determining future forces, mixing present forces, and evaluating mission accomplishment. <u>Decisionmaking</u> is relegated to the proper level with regard to resource usage. <u>Control</u> is made possible through a resource allocation process based on output centered information from the tactical unit level. The goal is long-term survival for the entire multi-level system by insuring an effective response at the boundaries where the system comes in contact with the external environment. These boundaries are permeable and exist both where resources are acquired (the strategic level deals with private industry) and used (the tactical level engages in combat).

Analysis of Current Models

One method to assess adaptive systems modeling is to analyze its current application. There have been two relatively recent examples of the types of models this study has addressed. The single-level cybernetic model was used by Howland, Colson, and McLean in an analysis of naval tactics (1973). The multi-level hierarchical model was used by Stafford Beer in describing an economic system (1974).

Naval tactics. In their <u>Tactical Analysis</u>, Howland, Colson, and McLean first establish a multi-level hierarchy of systems. At the strategic level is the office of naval operations whose job is defined as selecting ". . . man and machine components of FUTURE forces." At the operational level is "the Force Commander who utilizes. . . EXISTING forces. Task forces are formed by assembling available force units." Finally, at the tactical level

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are the Force Unit Commanders who command ". . . INDIVIDUAL tactical units maneuvered to perform assigned tasks and missions." This partitioned hierarchy of systems is built on the tactical unit level in a bottom-up scheme and for that reason the Tactical Analysis study concentrates on modeling the tactical unit level. The study focuses on anti-submarine warfare (ASW) with the ASW submarine as the specific tactical unit.

The tactical unit or single level model is concerned with an inside-out view of the tactical situation. In other words, the model represents only what is known by the ASW submarine (tactical unit) commander and is not the view of an outside observer who can visualize the entire tactical situation. The task sequence is standard for the ASW mission and is defined for the commander as: Search, Classify, Approach, Attack, and Escape.

Within the single-level structural model is one function known as the monitor which, as the reader recalls from the earlier general cybernetic model description, displays environmental, resource, and performance information. Now it is from this monitor that an analysis of the tactical unit's (submarine's) behavior can proceed. Environmental variables include, for example, the sound velocity at a particular depth. Resource variables are the man and machine components of the system. The state of these variables can be measured by such things as the amount of integral crew training received by the fire control approach team. The performance or essential variables which define the systems stability and display the submarine's capability to achieve its goal of killing an enemy submarine are represented by course, speed, and depth.

Through an analysis of the information provided by the monitor, the
relationships among the environment, the resources, and the submarine's
performance can be suggested. Some possible outcomes of using the tac-
tical unit model are suggested by the questions in the following categories:

Task accomplishment:

What event sequences are most frequently successful?

Environment:

Are there optimal environmental conditons for mission success?
Can these environmental conditions be controlled or used?

Resources:

What are the most effective resource mixes?

What are the quantities of resources used by these mixes?

Do various resource sequences influence performance?

What are the quantities of resources used by these sequences?

Are any time-resource tradeoffs suggested by the data?

How are resources used in normal as opposed to combat operations?

Performance:

What are the satisfactory and stable performance envelopes?

Are any performance-resource tradeoffs suggested by the data?
It is in testing the hypotheses generated by such questions that the tactical
unit model is of great value.

The general use of tactical unit models falls into two related cate-
gories: (1) The above-mentioned testing of clearly specified hypotheses
and (2) the explicit measurement of resource usage associated with the
tactical unit's behavior. Hypothesis testing permits the development of

tactics for effective employment. Measurement of resources associated with
mission accomplishment both suggests the efficient use of resources and
lets the planner know what quantities of resources are in fact being used.
Modeling actual behavior can give a base line of reality to planning. The
model can also be used to show capability by displaying only the efficient
behavior of the existing system. Finally, the model can show the system's
potential by projecting new subsystems into the tactical situation.

Economics. In February, 1973 Stafford Beer delivered a lecture which
described his work in modeling a developing economy. Essentially, Beer used
a multi-level hierarchical model. The tactical unit level is the firm.
The operational level is the industrial sector and the strategic (normative)
level is the total economic system. Beer refers to this hierarchical
relationship as recursion" . . . all viable systems contain viable systems
and are contained within viable systems."

The methodology of the planning relationship among the hierarchical
or recursive levels centers on the concepts of actuality, capability, and
potentiality. Actuality is the measure of the firm's output being achieved.
The measurement of actuality fluctuates continously since actual output is
susceptible to any environmental disturbance. Actuality is usually not
equal to capability due to imperfect organizational structure. Capability
is the output possible recognizing the constraining limitations of indivi-
dual subsystems.

> Capability is a systems concept: . . .'capability'
> is not to be confused with 'capacity' which is not
> a systems concept--because it alleges that some
> part of the system can in theory do something that
> may be rendered impossible by other parts (Beer,
> 1974).

Capability is a much steadier variable than actuality. _Potentiality_ is the _output gained_ by realistic relief of subsystem constraints. "We look for investment--in new equipment, to cure the bottlenecks, or in research to cure technological short comings." The potentiality variable has an absolute value," . . . until the system itself is structurally changed."

Control of this economic system is maintained by use of the ratios provided through measures of actuality, capability, and potentiality. There are three indicies: productivity, latency, and performance. _Productivity_ is the relationship between capability and actuality. _Latency_ compares potentiality and capability which can indicate needed investment. Finally, _performance_ measures potentiality against actuality giving some notion of the immediate worth of an innovation. The measures used to form these ratios can be of either inputs (raw materials) or outputs (finished stocks). Using outputs, the progression from actuality to potentiality results in larger numbers. If inputs are used with the same progression, the absolute value of the quantities becomes smaller. This is significant only in that while forming the ratios the smaller number is always used in the numerator producing an index less than one.

With this sort of control system, the computer becomes essential. Actualities are fed into the computer daily. Capability and potentiality once computed are retained in the memory bank. The indicies are then computed and compared with recent history. There are four possible outcomes: no change, transient change, change in slope, and a step change. The computer uses a management by exception methodology and only reports slope and step changes. The exact limits are established by the manager aware

of the critical value judgment not to discard too much information or over-react to too little information.

Now, how are these indices related up the hierarchy? Only the manager at the firm level receives any information about the details of his enter-prise. He also has the use of the computer to experiment with varying inputs. Indicies reflecting exceptional data are sent to the next mana-gerial level. This information is sent after an appropriate delay for the firm manager to do something about an emerging problem. He is notified when the next level is being alerted. The assumption is that the firm manager will take care of the situation; however, it is also clear that some classes of problems are the proper concern of higher managerial levels if they are to be solved.

This then is a brief discussion of a multi-level model with an economic base. It references a lower level acquisition input and a top level eco-nomic output. In a sense the defense multi-level model uses an opposite set of circumstances. The top level acquires resource inputs and the bottom level uses them. But in both models the external environment is directly interacted with twice (acquisition and use) and the relationship among levels reflects an information flow in both directions. This multi-level model, as in the single-level model, enables the strategic planner to both keep track of current operations and test innovations. The single-level model can provide the tactical information for the multi-level model to communicate.

Summation

The paper thus far has provided the reader with some notion of the need for a new strategic modeling approach, an explanation of what is meant by adaptive systems concepts, and an analysis of current efforts with cybernetic

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models in naval anti-submarine operations and the economic sector. By way of summary, the study briefly addresses the relevance, feasibility, and utility of using adaptive systems concepts for a strategic planning methodology.

Relevance. Two problems with strategic planning were described at the beginning of this study. They were, first, that as the strategic planner acquires resources he has lost touch with the resource user at the tactical level. Secondly, because of this information shortage, the resource acquisition logic is based more on an input basis with an incremental and competitive approach to budgeting than the necessary effectiveness of a combat output. This statement does not argue against PPBS and the weapon system acquisition process. The point is that the rational process model is necessary but not sufficient. An adjunct model is needed to provide a closed loop between the force level input and a combat output. Perceiving the resource management of the Department of Defense as a system in contact with an external environment at two locations, the point where the system interacts with the private sector for resource acquisition is reasonably well-defined. However, where the system interacts with the environment for resource use in combat is not well-defined. This is a relevant problem for the strategic planner as he acquires and allocates resources and also as he must argue persuasively for the monies to obtain these resources.

Feasibility. In order to provide the strategic planner with a methodology he can use to associate resource acquisition with a combat output, two models are required. One describes the tactical unit level where the defense resources are used in combat. The second model transmits this

information in useful form to the strategic level. The question of feasibility raises the issue of whether this can be done. In this particular instance, the question is directed more at the ability of the Defense Department to conceptualize what must be done than questions of hardware or technology. The projects referenced in this paper have shown that the modeling procedures are within the state of the art. If the state of the art limit is being approached, it is in Defense's ability to define tactical units, to sense interdependencies, and to adapt an organizational structure which can accept and use this information. This is perhaps a strength of this particular modeling approach in that it depends on the insights of the people who actually work with the defense systems. To quote Stafford Beer, "You do not need a string of degrees to understand how to . . . chart . . . the activity that surrounds your daily life (1974)." The expertise of the researcher is used for teaching and guiding a systems approach to modeling.

Utility. The question of utility is mainly, of what use is the solution? Did the solution answer the relevant question? Fundamentally, the models are attempting to deal with the uncertainty of future combat. The multilevel and single-level models in combination can do two things: (1) The models can test hypotheses and discover interrelationships and tradeoffs which can aid in determining a state of readiness and in fact improve that state of readiness. The models observe and measure behavior. This behavior results in event and performance information which can update tactics. (2) The models explicitly measure the use of resources. The resource use relates directly to the allocation and acquisition processes.

Harkabi discusses the type of strategic methodology presented by
this paper in his publication, <u>Nuclear War and Nuclear Peace</u>:

> In the past strategy dealt with the application of
> force, the allocation of units and their maneuver-
> ing more than with the planning of force structure.
> In nuclear strategy the planning of force structure
> has become of much greater importance. Quantitative
> analysis can be very useful . . . but ultimately
> great strategic decisions will always be based on
> estimates and calculated risks (1966).

In the current world situation, acquisition during strategic combat
is not likely. For this reason and due to the enormity of the stakes
involved, force level determination is critical. This essay advocates a
new concept to meet the challenge of an uncertain future. No pretense
is made to automate essential value judgments.

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ADAPTIVE SYSTEMS CONCEPTS AND
THEIR APPLICATION TO STRATEGIC PLANNING

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Abstract

PURPOSE: To explore the use of adaptive systems concepts and cyber-
netic modeling techniques in order to accomplish the task of force
level planning. The intent is to link strategic level force planning
with tactical level resource usage.

DISCUSSION: The essay presents two models. The first is a cybernetic
model at the tactical unit level which relates performance, resources,
and goal achievement. The second model is hierarchical and interrelates
the strategic planner and the tactical user with information flows.

CONCLUSIONS:

    1. The relevance of the paper centers on a displayed need for strate-
gic force level planning in the context of combat effectiveness.

    2. The feasibility of the models is contested not so much by the
significant rigor of the computer technology but by the Defense
organization's desire to accept a systems concept.

    3. The utility of the models is twofold. The models permit
hypotheses testing prior to combat implementation and also the measure-
ment of resource expenditures.

--32 pages