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SELECTIVE SERVICE AND THE ALL-VOLUNTEER FORCE

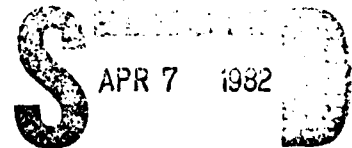
Bernard Rostker

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SELECTIVE SERVICE AND THE ALL-VOLUNTEER FORCE

By Bernard Rostker*

One of the most emotional issues concerning American military preparedness is that of the draft and the All-Volunteer Force. Some see the absence of an active conscription program as a fundamental sign of American military weakness and a lack of resolve. While the Reagan Administration, after a year of internal debate and in the shadow of developments in Poland, decided to continue draft registration, it repeatedly has stated that it believes America should and can rearm without reinstating conscription.

Opinion about conscription does not recognize traditional ideological divisions of liberal and conservative. As a candidate, President Reagan said, "Only in the most severe national emergency does the government have a claim to the mandatory services of its young people. In any other time, a draft or draft registration destroys the very values that our society is committed to defending."** Jim Fallows, in his National Defense, argues that the "connection between a nation and the force that defends it is not defined by pay rates and fringe

* The author was Director of Selective Service from November 1979 to August 1981, and is presently the Director of the Navy Management Program at the Center for Naval Analyses. The views expressed in this paper reflect the author's experience while Director of Selective Service and do not necessarily represent the opinion of the Center for Naval Analyses or the Department of the Navy.

** Statement by the President, The White House, Office of the Press Secretary, January 7, 1982.

benefits alone, but rather by the bonds of trust and sacrifice....If current trends continue, we will soon be at a point where very few educated white people will have had any firsthand exposure to the military... Defense is a serious business, not to be discussed in airy generalizations or contracted out to the poor."

The Selective Service System is caught squarely in the middle between those who support the AVF and those who desire a return to peacetime draft. In truth, Selective Service is both a complement to the AVF, as well as its substitute. As its complement, a strong and responsive Selective Service System adds to the viability of the AVF by insuring the ability of the Nation to mobilize during an emergency. As its substitute, it is an alternative means of procuring military manpower during both peace and war. In the next pages we will consider Selective Service in these roles and argue that a strong and viable Selective Service System has a genuine place in America's defense posture regardless of the military personnel procurement policy the Nation follows.

Selective Service as a Complement to the All-Volunteer Force

The opening recommendation of the Gates Commission in support of the AVF recognized the basic complementarity of Selective Service and a volunteer force: "We unanimously believe that the nation's interest will be better served by an all-volunteer force, supported by an effective standby draft, than a mixed force of volunteers and

conscripts." The Congress agreed with this approach and in 1971, anticipating the advent of the AVF, amended the Military Selective Service Act (MSSA) to provide that: "the Selective Service...shall...be maintained as an active standby organization with (1) a complete registration and classification structure capable of immediate operations in the event of a national emergency and (2) personnel adequate to reinstate immediately the full operation of the system...in the event of a national emergency."

As a point of reference, in FY 1973 the AVF became a reality. The last draft calls were issued in December 1972; statutory authority to induct expired in June 1973. On April 1, 1975, President Ford suspended the requirement that those subject to the MSSA must register with the Selective Service System. Classification actions were terminated and local boards, State Headquarters and appeal boards were closed in CY 1976.

What is expected of Selective Service in support of the AVF and how well has the Agency prepared for an emergency? As provided by Congress, the Selective Service is a "standby" system whose purpose is to support a military mobilization. The system must be ready, without notice, to provide the untrained manpower that would be required to staff our Armed Services during a military emergency, while protecting individual rights through a fully developed system of administrative due process. The specific requirements--numbers of people and delivery schedule--are set by the Secretary of Defense.

In the mid-1970's, the Secretary of Defense established an induction requirement which Selective Service believed could be met without difficulty. In October 1977, however, Defense increased the requirement. The requirement was again increased in November 1980. Table 1 contrasts the 1975, 1977, and 1980 induction schedules.

TABLE 1
DOD INDUCTION SCHEDULE

	<u>First Inductions</u>	<u>100,000 Inductions</u>	<u>Total inductions in six months</u>
1975	M ^a +110 days	M+150 days	--
1977	M+30 days	M+60 days	650,000
1980	M+13 days	M+30 days	--

^aM = mobilization day.

Between 1977 and 1979 the ability of the Selective Service to meet the revised schedule was the subject of a number of critical reviews, including reports by the Congressional Budget Office, the General

Accounting Office and the President's Reorganization Project.* Each study concluded, as did the Acting Director of Selective Service in a report to the Congress (March 1979), that, Selective Service does "not presently have the capability to meet the Department of Defense wartime manpower requirements from our 'deep standby' status."**

In January 1980, in response to the invasion of Afghanistan by the Soviet Union, President Carter called for a revitalization of the Selective Service System and a return to registration. While this was a shift in Administration policy, the President felt that the change was justified on the grounds that registration would increase our preparedness, assure our ability to respond and demonstrate our resolve. President Carter's decision substituted an operating system for a not fully developed and untested contingency plan and in so doing enhanced Selective Service's ability to respond in an emergency. An independent study by the General Accounting Office confirmed the Administration's contention and stated that, "The President's recent decision to resume peacetime registration will enhance (Selective Service) operations and improve national defense capabilities... With an ongoing program of

* The Congressional Budget Office found that Selective Service could not meet DoD's wartime induction schedule because it did not have a reliable plan for a quick, mass registration; the ADP support was neither adequate nor appropriate; and the field structure was too complex and cumbersome. See: Congressional Budget Office, The Selective Service System: Mobilization Capabilities & Option for Improvement. (Washington: Government Printing Office, 1978), p.23.

** Director of Selective Service, Semiannual Report of the Director of Selective Service: Oct 1, 1978-Mar 1, 1979. (Washington: Government Printing Office, 1979), p.1.

registration, system weaknesses can be identified and corrected before mobilization occurs rather than after mobilization.*

The first mass draft registration since 1948 was accomplished between July 21 and August 3, 1980. During that period, men born in 1960 and 1961 were required to register. In its audit of the registration, the General Accounting Office reported that "draft registration is complete and accurate."** The report verifies the Selective Service count of registrations on hand at more than 3.6 million, and affirms that Selective Service estimates of the probable registration population of 3.88 million were "reasonable." On review of Selective Service procedures and the number of registration cards received and inventoried, the GAO reported, "In all instances the System's count and our count agree." The GAO also, through statistically-valid sampling techniques, estimated that fewer than 1,000 cards represent obviously fictitious registrations.

The success of the registration is best seen in the improved ability of Selective Service to respond as tested in mobilization

* Letter from the Comptroller General to the Director of Selective Service (July 22, 1980) accompanying Actions to Improve Parts of the Military Manpower Mobilization System are Underway. (Washington: General Accounting Office, 1980).

** Evaluation of the Recent Draft Registration (FPCD-81-30), (Washington: General Accounting Office, Dec 19, 1980).

exercises.* In 1978 the national mobilization exercise "Nifty Nugget" reported that the Selective Service System was not able to deliver manpower to the Department of Defense on a timely basis. In November 1980, Selective Service, as part of the 1980 mobilization exercise "Proud Spirit" demonstrated its ability to mobilize the Nation's manpower. The ability to meet assigned delivery schedules was made possible by reinstating registration.

While Selective Service has made great strides in developing a reliable and effective mobilization capability, there remain critics who would like to cancel the registration and return to a "post-mobilization" system, as well as those who believe registration has not gone far enough and want a program of pre-mobilization classification. When I was Director of Selective Service, I considered both options. In a report to the Congress in June 1981 I noted that in early 1980, Selective Service had developed a contingency plan for a post-mobilization registration that was summarized in a "Draft Report," dated January 16, 1980. This report was widely misrepresented by those

* While registration may be necessary, by itself it is not sufficient to insure an effective mobilization capability. The full "revitalization" of the Selective Service also included the development of an administrative law system which meets current standards of due process and the physical reconstitution of the Selective Service field structure. It should be noted that Selective Service is not only dedicated to the goal of providing the untrained manpower needed to augment the AVF should it be needed, but a fully developed administrative system to insure that every individual has access to a speedy, fair, and impartial hearing on application for deferment, exemption, or postponement. A fully ready system also include a trained local and appeal board structure, a management and ADP system to control the claims/adjudication process and an Alternative Service Program to complement the induction program.

opposing registration as a definitive statement that a post mobilization system could meet the mobilization schedules established by the Secretary of Defense. The basic elements of the "draft report" plan were, in fact, tested during the July 1980 registration. For example, the USPS conducted registration; the IRS handled data entry and the Department of Interior provided the necessary computer support. The "Draft Report" and its contingency plan proved faulty in several areas. It did not include provision for the massive data management effort required to ensure the quality of the registration file. Initial screening of data and error corrections was more complicated and labor intensive than originally anticipated. Moreover, registration took longer than originally projected. Even after Selective Service had taken six months to prepare for the registration--the President announced his decision to register on January 23, 1980, and signed the enabling legislation, H.J. Resolution 521 (PL 96-282), on June 27, 1980--Selective Service, the USPS and the IRS still needed nearly four weeks to launch registration. Many additional weeks were needed to put the registration data in a usable form. Briefing and training people, distributing publicity announcements, distributing registration materials, and solving logistics problems took more time than originally envisioned. Collecting data and entering it on computer tapes was slower than projected in the contingency plan.

If registration were canceled, Selective Service could develop a revised version of the original contingency plan. Based upon experience gained over the last two years, and assuming Selective Service had purchased and could maintain a complete standby system, the System should be able to issue induction orders in about 4 weeks: roughly two weeks to distribute stockpiled materials, publicize plans, train personnel, and conduct registration, and two weeks to collect the data, enter it on computer tapes, conduct a lottery, assign Random Sequence Numbers, and issue orders for induction. However, this estimate does not include unforeseen delays--delays which, in fact, developed during the 1980 registration. With registration, induction orders can now be issued within two days.

Other problems, however, would develop if Selective Service relied upon a post-mobilization registration to provide the names for an emergency conscription. A serious problem of fairness could result from the tendency of a substantial portion of the eligible population to register late. In early 1973 only 77 percent of the eligible population registered on time. However, subsequent late registrations did result in a 99 percent compliance rate. In 1980 about 87 percent of the eligible population registered on time; two months later compliance had grown to 93 percent. To ensure the fairness and equity of the System, the random selection should be made from the most complete pool of eligible registrants possible. The current on-going registration system allows for late registrations and would provide the largest possible pool from which to conscript should it become necessary to resume inductions.

The question of pre-mobilization classification was also fully considered and rejected by Selective Service. Under the Military Selective Service Act, classification is the determination at a given point in time of a person's availability for induction into the Armed Services. Ideally, classification should take place as close as possible to a probable induction date. Since situations change over time, it is necessary that, once determined, a person's classification be kept current to reflect his availability for military service. A pre-mobilization classification system would only add to our mobilization posture to the extent that classifications were permanent, thus enabling us to excuse those permanently disqualified at the time of induction. Unfortunately, most classifications are not permanent. Even in earlier periods, determination of hardship was considered valid for only one year. While it might be argued that certification of conscientious objector status is permanent, prudence dictates that local boards determine, at the time of possible induction, if a registrant still holds views consistent with the granting of a conscientious objector classification. Moreover, the denial of a conscientious objector claim cannot be viewed as permanent and as such the Selective Service would have to be prepared to re-adjudicate claims after mobilization. Similarly, failure to request any given classification during pre-mobilization could not be the basis for a denial of a request for post-mobilization reclassification.

The cost of registration and the improved capability that Selective Service has developed is high. It is not measured in terms of dollars,

but in terms of the prosecutions of those who willfully violate the law by failing to register. A knowing failure to register by those required to do so is a criminal offense punishable by a fine of up to \$10,000, or imprisonment for up to five years, or both. This criminal penalty and the response of those subject to the Military Selective Service Act to meet their legal responsibilities has resulted in the high level of compliance with the registration requirements. However, the failure of some to register is a serious offense and it places an undue burden upon those who do register as the law requires. Failure to enforce the law will surely result in reduced levels of future compliance and will erode the effectiveness of the military manpower mobilization system.

The objective of any compliance effort should be to encourage registrations. This is best served by an aggressive program of identification of non-registrants. If an effective identification system is developed, few actual prosecutions should be necessary since in the vast majority of cases the mere loss of a sense of anonymity will convince individuals to register. The key to the compliance program is identification.

Some have argued that Selective Service should not need a compliance program. Such is not and has never been the case. Curtis Tarr, Director of Selective Service from 1970-1972 noted that, "The most disturbing silent protest against Selective Service arose from failure to register. Only the young man knew certainly if he had complied with the law. We had no way to check upon his doing so. At one

point I investigated whether it would be possible for us to compare our records with those of Social Security or Internal Revenue; I was told bluntly that doing this would infringe on the privacy of the individual. I understood this, but I worried about the rights of the individual who had to go to war because another did not fulfill his obligation. Only in the small communities, where private matters often are perceived generally, did our boards know if young men registered."*

The most efficient and effective program for identification of non-registrants would involve a comparison between a list of registrants with a list or lists of those who would appear to be subject to the legal requirement to register. Non-Federal sources of data--such as commercial lists or files maintained by individual states--have been used in the past, but would not provide for equitable or uniform enforcement of the law throughout the United States. The most comprehensive list of potential registrants is the Social Security file. All other potential sources would systematically exclude some segment of the potential registrant population. For example, if Selective Service used driver's licence registrations and a given state would not or could not provide the needed data, then an identification program would be limited in that state. Further, the Selective Service System is a Federal program and should not have to rely on, or burden, individual states or private companies to enforce a Federal statute.

* Curtis W. Tarr, By the Numbers: The Reform of the Selective Service System 1970-1972, (Washington, D.C.: National Defense University Press, 1981) p.57.

In sum, Selective Service is a complement to the All-Volunteer Force. It strengthens the AVF by providing a mobilization capability which can deliver the untrained manpower need to augment our current forces during times of national emergency. The experience of Selective Service since 1972 strongly suggests that maintenance of the registration without pre-mobilization classification is the most efficient standby posture. The effectiveness of the System, however, depends upon the maintenance of high levels of compliance. A program to identify those who are required to, but have not registered, will encourage compliance and insure the effectiveness of the program.

Selective Service as a Substitute for the All-Volunteer Force

There should be no question that personnel problems exist under the AVF. Unfortunately, among the pages of criticism and hours of television exposes about real and perceived faults of the AVF there is almost nothing which defines conscription in terms of the policies that would be followed during a peacetime draft, or how conscription would correct the ills of the AVF. Such an examination need not be a defense of the AVF. But, if the Nation is to change the way it staffs its Armed Forces, it should not only understand the failings of the existing system but how an alternative will improve the current situation and the likely new problems that may develop. Consider the impact that conscription may have on some of the major personnel problems of the AVF:

o Social Representation. Many of the critics of the AFV see a return to conscription as a way of insuring that the white middle class will be fully represented in the Armed Forces. Unfortunately, the past decade of reform leaves Selective Service a poor tool to change the basic personnel structure of today's military. Such reforms as the national lottery have eliminated many of the problems of earlier draft. However, these reforms were directed at considerations of individual equity, not at correcting systemic personnel problems. Over the past seven years the Army has averaged over 97 percent of its quantitative goal for non-prior service males. Even in its poorest year, FY 1979, the Army recruited 86 percent of its goal. Therefore, unless the requirement for non-prior service personnel substantially increases, or we restrict the absolute numbers of volunteers, or discourage volunteers by substantially reducing compensation, few would be drafted and even fewer white middle class males would be drafted.

o Quality/Mental Aptitude. It is often argued that a draft would improve the distribution of personnel in the various mental group categories. The following table shows how the distribution of new recruits is likely to change under

various mixes of volunteers and draftees.* The 100 percent volunteers reflects the Army's FY 1981 distribution of recruits by mental category. The 100 percent inductees reflects our current best estimate of the underlying distribution of mental scores. It assumes that mental categories I, II, III, and upper IVs would qualify for conscription in the general youth population.** The chances of induction is also provided. It is assumed that the Army will continue to need 150 thousand new male recruits each year.

If a random lottery draft were used simply to make up recruiting shortages the composition of new accessions would change very little, and the composition of the entire Army by an even smaller amount.

* A similar analysis was done by Kenneth J. Coffey. See "If the Draft is Restored: Uncertainties, Not Solutions," William Taylor et al., ed., Defense Manpower Planning: Issues for the 1980s, (New York: Pergamon Press: 1981), pp. 250-265.

** See table 11.3, AFQT Composite-Males Born 60-62 in Martin R. Frankel and Harold A. Williams' The Profile of American Youth, (University of Chicago; National Opinion Research Center, 1981). The following table shows the distribution of the general male population and the draft eligible population, assuming that we would only draft category IVa or above.

	<u>I</u>	<u>II</u>	<u>III</u>	<u>IVa</u>	<u>Other</u>
Overall population	3.4	29.4	32.0	9.2	26.0
Draft Population	4.5	40.0	43.2	12.3	0

**MENTAL GROUP COMPOSITION OF ARMY NEW MALE
ACCESSIONS FOR VARIOUS VOLUNTEER/DRAFT MIXES**

<u>Percent</u>		<u>Mental group/I.Q.</u>				<u>Chance of induction</u>
<u>Volunteer</u>	<u>Inductee</u>	<u>I</u>	<u>II</u>	<u>III</u>	<u>IV</u>	
100	0	2.3	21.4	44.9	31.4	0
90	10	2.7	23.3	44.7	29.5	1/111
75	25	2.9	26.1	44.5	26.7	1/44
50	50	3.4	30.7	44.1	21.9	1/22
0	100	4.6	40.0	43.2	12.4	1/11

o Cost. Some have argued that a return to conscription would allow the Government to reduce the cost of defense because they could cut the pay of first term personnel. While this argument has some validity reduced compensation costs would be substantially offset by increased cost of turnover and training which would accompany a two-year draft period, as compared with the current four-year enlistment. Moreover, recent major personnel compensation increases have been designed to retain career personnel. This problem, and its associated costs are not likely to be impacted by a return to conscription. A return to conscription would bring with it a new set of problems for both the Nation, as well as the military itself.

o Nation. Over the last seven years the Army has required less than 150 thousand new male accessions annually to sustain its sixteen active division force structure. There are approximately two million men in each new Selective Service year group, i.e., approximately two million young men reach their 20th birthdays each year. Even at a fifty-fifty volunteer/draft mix, Selective Service would induct into the Army less than 5 percent of the prime age cohort. Even under the policy of random selection followed by Selective Service an induction program which took so relatively few would raise serious questions of equity and therefore public support. Alternatives such as Universal Military Training and National Service also raise serious questions which cannot be ignored, and will be discussed below.

o Military. The fundamental truth of the AVF is that at least at the beginning of an enlistee's service, he wants to be in the military. Such is generally not true of a conscript, and to varying degrees the Services can expect new problems to develop. For example, it is widely reported that large numbers of our youth population use marijuana. In order to prevent the simple declaration of an intention to continue marijuana use from becoming a major loophole in the draft system, the military will have

to loosen its current enlistment standards. Moreover, if the Service continues to follow a liberal "for-the-good-of-the-Service" discharge program for "ineffective" personnel, the draft will quickly turn into a revolving door. It is doubtful that societal pressure will enforce sanctions against those who fail to receive "good conduct" discharge at the end of their period of conscription if a very small proportion of those eligible for conscription are drafted, or if the draft does not have the extensive support it had during W.W. II or before Viet Nam. Without such pressure the cost of failing in the military is the individual's lost opportunity; that cost is likely to be substantial for those who voluntarily associate themselves with the military and very little for those who are compelled to serve. From a purely military viewpoint, the case for resumption of the draft is not persuasive.

Many of the problems which are mentioned concerning a mixed volunteer/draft system might disappear under a program of Universal Military Training or National Service; unfortunately to be replaced by an even greater set of problems.

- o Universal Military Training (UMT). Many believe that the Nation's military capability has been compromised by the "social experiment" known as the All-Volunteer Force. In

fact, UMT would be a greater social experiment which would likely reduce the ability of American forces to wage a conventional war. UMT is presented as a way of getting around the fairness problem associated with small draft calls--if it is unfair to take only 5 percent of each year's group, it must be fair to take 100 percent--or as a way of bringing the benefit of the Spartan life and "a little military discipline" to America's youth. Those who argue for UMT never speak in terms of how millions of marginally trained and poorly equipped soldiers will add to our national defense.

As already noted, the Army requires approximately 150 thousand new male accessions each year to support 16 active divisions. There are approximately 2 million young men in each new 20-year-old birth group. Even excluding those found to be unfit for military service we would have to increase the Army's ability to process and train new recruits ten-fold in order to initiate a UMT program. We would have to subordinate the current mission of the Army, which is to ready our divisions to fight, to the new task of training each year hundreds of thousands of basic infantrymen. Currently our forces do not have all the modern equipment they require. The costs of training these new infantrymen would decrease our ability to

modernize our 16 divisions. Moreover, since it is highly unlikely that we will use our conventional Army forces on the North American continent, we would have to provide massive overseas transportation for our new UMT force if it were to contribute in any future military engagement.

While some cite the experience of our European allies as examples of UMT, they fail to examine the impact that UMT has had on their ability to fight. The Dutch, in order to accommodate UMT, have reduced the initial military tour to only a few months and have foregone the opportunity to train the mass of conscripts in the advanced skills needed to support modern military equipment. Moreover, the cost of such a program must reduce a nation's ability to buy advanced weapons systems. This policy may still make sense for Holland, given her geography and the fact that a large transportation system is not needed to carry her soldiers into combat; however, it does not necessarily make sense for us.

- o National Service. National Service has often been proposed by those who recognize the problems that UMT would cause for the military.* Paramount in any consideration of National Service is the constitutional

* See Congressional Budget Office, National Service Programs and Their Effects on Military Manpower and Civilian Youth Programs, Washington: U.S. Congress, 1978).

and discipline. Herein lies a unique opportunity to reduce the requirement for supervisors and use the services of the National Service enrollees. Some could enforce discipline on those who don't go along with the program. In order not to confuse their roles, we could call the latter guards and the former inmates.

If a National Service program were voluntary and designed to foster skill development it would most likely look like Job Corps or CETA public employment programs. The Reagan Administration has recently cut back on the Federal Governments commitment to these programs charging that they were "make work" programs which added little to the public welfare. Careful consideration must be given before we experiment with anything as massive, costly, and potentially disruptive as National Service.

In the preceeding pages I have argued that the current structure of Selective Service is appropriate for the 1980s. Selective Service as a complement to the AVF can perform its assigned mission. Registration should be maintained and enforced. There is no need to extend present procedures to pre-mobilization classification.

As a substitute for the AVF, a return to conscription will bring a whole new set of problems. The Nation must consider the likely cost and

impact of trying to fix the AVF, as compared to the benefits and problems associated with the draft. After full consideration, it may well turn out that the problem foreseen in this paper can be overcome, or are not as serious as the effects of continuing the AVF. However, if we are to change our military manpower procurement policy we need some assurance that the draft will increase our national defense capability.

CNA PROFESSIONAL PAPERS - 1976 TO PRESENT*

- PP 211
Mizrani, Maurice M., "On Approximating the Circular Coverage Function," 14 pp., Feb 1976, AD A054 429
- PP 212
Mangel, Marc, "On Singular Characteristic Initial Value Problems with Unique Solution," 20 pp., Jun 1978, AD A058 535
- PP 213
Mangel, Marc, "Fluctuations in Systems with Multiple Steady States. Application to Lanchester Equations," 12 pp., Feb 78 (Presented at the First Annual Workshop on the Information Linkage Between Applied Mathematics and Industry, Naval PG School, Feb 23-25, 1978), AD A071 472
- PP 214
Weinland, Robert G., "A Somewhat Different View of The Optimal Naval Posture," 37 pp., Jun 1978 (Presented at the 1976 Convention of the American Political Science Association (APSA/IUS Panel on "Changing Strategic Requirements and Military Posture"), Chicago, Ill., September 2, 1976), AD A056 228
- PP 215
Colle, Russell C., "Comments on: Principles of Information Retrieval by Manfred Kochen," 10 pp., Mar 78 (Published as a Letter to the Editor, Journal of Documentation, Vol. 31, No. 4, pages 298-301), December 1975), AD A054 426
- PP 216
Colle, Russell C., "Lotka's Frequency Distribution of Scientific Productivity," 18 pp., Feb 1978 (Published in the Journal of the American Society for Information Science, Vol. 28, No. 6, pp. 366-370, November 1977), AD A054 425
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Colle, Russell C., "Bibliometric Studies of Scientific Productivity," 17 pp., Mar 78 (Presented at the Annual meeting of the American Society for Information Science held in San Francisco, California, October 1976), AD A054 442
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- PP 222
Mizrani, Maurice M., "Correspondence Rules and Path Integrals," 30 pp., Jun 1978 (Invited paper presented at the UNRS meeting on "Mathematical Problems in Feynman's Path Integrals" Marseille, France, May 22-26, 1978) (Published in Springer Verlag Lecture Notes in Physics, 106, (1979), 154-155), AD A055 536
- PP 223
Mangel, Marc, "Stochastic Mechanics of Molecule-Molecule Reactions," 21 pp., Jun 1978, AD A056 227
- PP 224
Mangel, Marc, "Aggregation, Bifurcation, and Extinction in Exploited Animal Populations," 48 pp., Mar 1978, AD A058 536
*Portions of this work were started at the Institute of Applied Mathematics and Statistics, University of British Columbia, Vancouver, B.C., Canada
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Mangel, Marc, "Oscillations, Fluctuations, and the Hopf Bifurcation," 43 pp., Jun 1978, AD A058 537
*Portions of this work were completed at the Institute of Applied Mathematics and Statistics, University of British Columbia, Vancouver, Canada.
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Ralston, J. M. and J. W. Mann, "Temperature and Current Dependence of Degradation in Red-Emitting GaP LEDs," 34 pp., Jun 1978 (Published in Journal of Applied Physics, 50, 3630, May 1979) AD A058 538
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- PP 229
Mangel, Marc, "Diffusion Theory of Reaction Rates: Formulation and Einstein-Smoluchowski Approximation," 50 pp., Jan 1978, AD A058 541
- PP 230
Mangel, Marc, "Diffusion Theory of Reaction Rates, II: Ornstein-Uhlenbeck Approximation," 34 pp., Feb 1978, AD A058 542
- PP 231
Wilson, Desmond P., Jr., "Naval Projection Forces: The Case for a Responsive MAF," Aug 1978, AD A054 543
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Jacobson, Louis, "Can Policy Changes Be Made Acceptable to Labor?" Aug 1978 (Submitted for publication in Industrial and Labor Relations Review), AD A061 528

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- PP 233
Jacobson, Louis, "An Alternative Explanation of the Cyclical Pattern of Quits," 23 pp., Sep 1978
- PP 234 - Revised
Jondrow, James and Levy, Robert A., "Does Federal Expenditure Displace State and Local Expenditure: The Case of Construction Grants," 25 pp., Oct 1979, AD A061 529
- PP 235
Mizrahi, Maurice M., "The Semiclassical Expansion of the Anharmonic-Oscillator Propagator," 41 pp., Oct 1978 (Published in Journal of Mathematical Physics 20 (1979) pp. 844-855), AD A061 538
- PP 237
Maurer, Donald, "A Matrix Criterion for Normal Integral Bases," 10 pp., Jan 1979 (Published in the Illinois Journal of Mathematics, Vol. 22 (1978), pp. 672-681)
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