

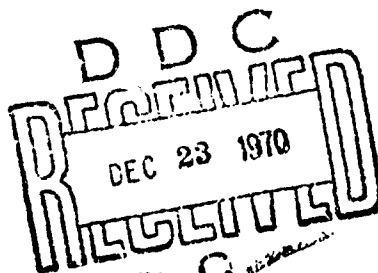
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R-530

JULY 1970

PUBLICATIONS OF THE ECONOMICS DEPARTMENT, 1963-1970

Compiled by Harriett Porch



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To obtain copies of these bibliographies, and to receive information on how to obtain copies of individual publications, write to Communications Department, Rand, 1700 Main Street, Santa Monica, California 90406.

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JULY 1970

PUBLICATIONS OF THE
ECONOMICS DEPARTMENT,
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PREFACE

This index presents a numerical listing of unclassified publications issued by the Rand Economics Department between January 1, 1963 and June 30, 1970. The listings, together with their abstracts, are grouped by type of publication, that is, Books, Reports (Rs), Rand Memorandums (RMs), and Papers (Ps). Subject and author listings are also provided. Economics Department studies published in the open literature as journal articles are shown in a separate list, arranged by author.

Because this is a departmental index, it excludes publications issued by other departments unless a member of the Economics Department was a co-author. The work of authors in other Rand departments is included if the publication was issued by the Economics Department.

Publications by Economics Department authors for the years prior to 1963 appear in *Economic Department Publications, 1948-1962: An Author Index of the Open Literature with Abstracts*, RM-2800-2, January 1967. Comprehensive indexes of all Rand open-literature publications can be found in the *Index of Selected Publications of The Rand Corporation, 1946-1962*, and *Selected Rand Abstracts* (published quarterly), for 1963 onward.

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INFORMATION

SUPPORTING AGENCIES

The agencies supporting Rand research are identified by suffixes to publication numbers, as follows:

| | |
|---|--------------|
| Advanced Research Projects Agency | RM-0000-ARPA |
| Agency for International Development | RM-0000-AID |
| Air Force Project RAND | RM-0000-PR |
| Air Force Technical Applications Center | RM-0000-AFT |
| Arkansas Planning Commission | RM-0000-APC |
| Atomic Energy Commission | RM-0000-AEC |
| Carnegie Corporation (Grant) | RM-0000-CC |
| Defense Atomic Support Agency | RM-0000-DASA |
| Department of Commerce (ESSA) | RM-0000-ESSA |
| Department of Transportation | RM-0000-DOT |
| The Ford Foundation | RM-0000-FF |
| National Aeronautics and Space Administration | RM-0000-NASA |
| National Institutes of Health | RM-0000-NIH |
| National Library of Medicine (HEW) | RM-0000-NLM |
| National Science Foundation | RM-0000-NSF |
| New York City | RM-0000-NYC |
| Office of Economic Opportunity | RM-0000-OEO |
| Office of Naval Research | |
| (Naval Research Laboratory) | RM-0000-NRL |
| Office of the Assistant Secretary of Defense | |
| (International Security Affairs) | RM-0000-ISA |
| Office of the Assistant Secretary of Defense | |
| (Systems Analysis) | RM-0000-SA |
| Port of New York Authority | RM-0000-PA |
| RAND Corporation-supported research | RM-0000-RC |
| San Jose Unified School District | RM-0000-SJS |
| San Mateo School District | RM-0000-SMS |
| U.S. Patent Office | RM-0000-PAT |

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PRICE SCHEDULE*

| Page Count | Price |
|--------------------|-------|
| 1-49 | \$1 |
| 50-99 | 2 |
| 100-199 | 3 |
| 200 and over | 4 |

*Each publication is priced separately, according to the number of pages it contains. Prices may also be obtained from Rand by mail or telephone. They include fourth-class postage. California residents add $5\frac{1}{2}$ percent sales tax.

This schedule applies to all Rand publications except books published by commercial publishers or university presses, which may be purchased from a bookseller or directly from the publisher. They are not available from Rand.

Deposit Collections, by Subscription. Annual subscriptions to Rand unclassified publications are available to academic, public, and research libraries. Subscribers automatically receive a copy of each publication as it is released—typically 400 to 500 titles each year—together with the quarterly journal, *Selected Rand Abstracts*, which indexes and abstracts all publications included in the subscription collections. (Books are excluded.) The current fee for this service is \$200 per year for domestic mailing, \$225 per year for foreign mailing. Subscriptions are accepted at the discretion of the Corporation.

Librarians interested in obtaining deposit collections for their institutions are invited to write to the Corporation.

United States Government Documentation Centers

Several government agencies distribute Rand publications. The Clearinghouse for Federal Scientific and Technical Information (CFSTI) offers them for public sale. Address inquiries to the Clearinghouse, U.S. Department of Commerce, Springfield, Virginia 22151.

The Defense Documentation Center (Dl. C) serves government agencies and non-government organizations that have contracts with the Department of Defense. Instructions and the forms necessary for establishing service may be obtained from the Defense Documentation Center, Cameron Station, Alexandria, Virginia 22314.

Rand publications resulting from research supported by the National Aeronautics and Space Administration (NASA) may be obtained from the NASA Scientific and Technical Information Facility, P.O. Box 33, College Park, Maryland 20740.

Academic and Public Libraries

Rand has placed deposit collections of unclassified Rand publications in over 175 libraries in the United States and abroad. These publications are available to library patrons on the same basis as other holdings and are subject to the same rules and regulations. They may be obtained by patrons of other libraries through the Interlibrary Loan Service. Deposit libraries are authorized to reproduce materials from the Rand collection for their patrons. Following is a list of deposit libraries.

ALABAMA

- Auburn University (1965)
Ralph Brown Draughon Library
Auburn, Alabama 36830

ALASKA

- University of Alaska (1970)
Library
College, Alaska 99701

ARIZONA

- Arizona State University (1966)
ASU Library
Tempe, Arizona 85281
- University of Arizona (1965)
Science Division Library
Tucson, Arizona 85721

ARKANSAS

- University of Arkansas (1970)
University Library
Fayetteville, Arkansas 72701

CALIFORNIA

- University of California
General Library
Berkeley, California 94720
- Chico State College (1963)
Library
Chico, California 95926
- University of California (1969)
Library
Davis, California 95616
- California State College at
Fullerton (1968)
Library
Fullerton, California 92631
- California State College at
Hayward (1970)
Library
Hayward, California 94542
- University of California (1965)
University Library
Irvine, California 92650
- University of California
Engineering and Mathematical
Sciences Library
Los Angeles, California 90024
- University of Southern
California (1965)
University Library
Los Angeles, California 90007

California Institute of Technology
General Library
Pasadena, California 91109

- California State Polytechnic College (1968)
Library
Pomona, California 91768
- University of California (1967)
University Library
Riverside, California 92502
- California State Library (1969)
Sacramento, California 95809
- San Diego State College (1970)
International Relations Lab
San Diego, California 92115
- California State Polytechnic College (1970)
Dexter Memorial Library
San Luis Obispo, California 93401
- University of California (1968)
Library
Santa Barbara, California 93106
- University of California (1969)
University Library
Santa Cruz, California 95060
- Stanford University
Library
Stanford, California 94305

COLORADO

Documents Library
U.S. Air Force Academy,
Colorado 80840

Denver Public Library
Denver, Colorado 80203

CONNECTICUT

- Wesleyan University (1970)
Olin Library
Middletown, Connecticut 06457
- Yale University
Library
New Haven, Connecticut 06520
- University of Connecticut (1963)
Wilbur Cross Library
Storrs, Connecticut 06268

FLORIDA

- University of Miami (1967)
Otto G. Richter Library
Coral Gables, Florida 33124
- University of Florida
Engineering and Physics Library
Gainesville, Florida 32603

- Florida Technological University (1970)
Library
Orlando, Florida 32816

GEORGIA

- University of Georgia (1967)
University Libraries
Athens, Georgia 30601
- Georgia Institute of Technology
Price Gilbert Library
Atlanta, Georgia 30332

HAWAII

University of Hawaii
Library
Honolulu, Hawaii 96822

ILLINOIS

- Eastern Illinois University (1963)
Booth Library
Charleston, Illinois 61920
- University of Chicago
Library
Chicago, Illinois 60637
- Northern Illinois University (1964)
Sven Franklin Parson Library
DeKalb, Illinois 60115
- Saint Louis University (1966)
Parks College of Aeronautical
Technology (Library)
East St. Louis, Illinois 62201
- Northwestern University (1969)
Technological Institute Library
Evanston, Illinois 60201
- Illinois State University (1970)
Milner Library
Normal, Illinois 61761
- University of Illinois
Library
Urbana, Illinois 61801

INDIANA

- Indiana University (1966)
Library
Bloomington, Indiana 47401
- Purdue University
Library
Lafayette, Indiana 47907
- University of Notre Dame (1970)
Memorial Library
Notre Dame, Indiana 46556

*Indicates libraries having deposit collections beginning with the year shown in parentheses. All others have collections that go back ten or more years.

IOWA

Iowa State University of Science
and Technology
Library
Ames, Iowa 50010
State University of Iowa
University Libraries
Iowa City, Iowa 52240

KANSAS

- Kansas State University (1965)
Library
Manhattan, Kansas 66504
- Wichita State University (1970)
Library
Wichita, Kansas 67208

KENTUCKY

University of Kentucky
University Libraries
Lexington, Kentucky 40506

LOUISIANA

- Louisiana State University
in New Orleans (1969)
Earl K. Long Library
New Orleans, Louisiana 70122
- Tulane University (1965)
Science Library
New Orleans, Louisiana 70118

MARYLAND

- Johns Hopkins University
Library
Baltimore, Maryland 21218
- University of Maryland (1966)
Engineering Library
College Park, Maryland 20742

MASSACHUSETTS

- University of Massachusetts (1967)
University Library
Amherst, Massachusetts 01002
- Boston Public Library (1963)
Boston, Massachusetts 02117
- Harvard University
Gordon McKay Library
Cambridge, Massachusetts 02128
- Massachusetts Institute of
Technology
MIT Libraries
Cambridge, Massachusetts 02139
- Boston College (1965)
Baptist Library
Chestnut Hill, Massachusetts 02167

MICHIGAN

- University of Michigan
General Library
Ann Arbor, Michigan 48104
- Detroit Public Library (1966)
Detroit, Michigan 48202
 - Michigan State University (1965)
Library
East Lansing, Michigan 48820
 - Western Michigan University
(1965)
Dwight B. Waldo Library
Kalamazoo, Michigan 49001

MINNESOTA

University of Minnesota
Library
Minneapolis, Minnesota 55455

MISSOURI

- University of Missouri (1965)
University Library
Columbia, Missouri 65201
- Linda Hall Library
Kansas City, Missouri 64110
- University of Missouri (1964)
Jefferson Library
St. Louis, Missouri 63121
- Washington University
John M. Olin Library
St. Louis, Missouri 63130

MONTANA

- Montana State University (1966)
Library
Bozeman, Montana 59715

NEBRASKA

University of Nebraska
University Libraries
Lincoln, Nebraska 68508

NEVADA

- University of Nevada (1966)
Library
Las Vegas, Nevada 89109
- University of Nevada (1967)
Library
Reno, Nevada 89507

NEW HAMPSHIRE

- Dartmouth College (1968)
Baker Library
Hanover, New Hampshire 03755

NEW JERSEY

Princeton University
Library
Princeton, New Jersey 08540

NEW MEXICO

- University of New Mexico (1968)
Zimmerman Library
Albuquerque, New Mexico 87106

NEW YORK

- New York State Library (1968)
Albany, New York 12224
- State University of New York
at Albany (1970)
University Library
Albany, New York 12203
- New York University (1970)
Engineering & Science Library
Bronx, New York 10453
- Brooklyn Public Library (1970)
Brooklyn, New York 11238
- Buffalo and Erie County
Public Library (1963)
Buffalo, New York 14203
- State University of New York
at Buffalo (1966)
Lockwood Memorial Library
Buffalo, New York 14214

Cornell University
University Library
Ithaca, New York 14850

Columbia University
Engineering Library
New York, New York 10027

New York Public Library
New York, New York 10018

- University of Rochester (1969)
Library
Rochester, New York 14627

- State University of New York
at Stony Brook (1965)
Library
Stony Brook, New York 11790

- Syracuse University (1965)
Library
Syracuse, New York 13210

NORTH CAROLINA

Duke University Library
Durham, North Carolina 27706

- Wake Forest University (1970)
Library
Winston-Salem, North Carolina 27109

OHIO

- University of Akron (1970)
University Library
Akron, Ohio 44304
- Case Institute of Technology
(1965)
Library
Cleveland, Ohio 44106
- Cleveland Public Library
Cleveland, Ohio 44114
- Ohio State University
University Libraries
Columbus, Ohio 43210
- Kent State University (1963)
Library
Kent, Ohio 44240
- University of Toledo (1970)
Library
Toledo, Ohio 43606
- Air Force Institute of Technology
Library (1967)
Wright-Patterson Air Force Base,
Ohio 45433

OKLAHOMA

University of Oklahoma
Library
Norman, Oklahoma 73069

OREGON

- Oregon State University
Library
Corvallis, Oregon 97331
- Portland State University
Library
Portland, Oregon 97207
 - Oregon State Library (1970)
Salem, Oregon 97310

PENNSYLVANIA

- Temple University (1970)
Library
Philadelphia, Pennsylvania 19122

Carnegie Library of Pittsburgh
Pittsburgh, Pennsylvania 15213

- University of Pittsburgh (1968)
Hillman Library
Pittsburgh, Pennsylvania 15213

- Pennsylvania State University (1965)
Pattee Library
University Park, Pennsylvania 16802

RHODE ISLAND

Brown University
Library
Providence, Rhode Island 02914

SOUTH CAROLINA

- University of South Carolina (1969)
McKisick Memorial Library
Columbia, South Carolina 29208

TENNESSEE

- Memphis State University (1964)
John Brister Library
Memphis, Tennessee 38111
Joint University Libraries
Nashville, Tennessee 37203

TEXAS

- University of Texas
Library
Austin, Texas 78712
- West Texas State University (1970)
Library
Canyon, Texas 79015
- Texas A&M University (1965)
Library
College Station, Texas 77843
- Southern Methodist University (1969)
Fondren Library
Dallas, Texas 75222
Rice University
Library
Houston, Texas 77001
- University of Houston (1969)
Library
Houston, Texas 77004

UTAH

- Brigham Young University (1965)
Library
Provo, Utah 84601
University of Utah
Engineering Library
Salt Lake City, Utah 84112

VIRGINIA

- Virginia Polytechnic Institute (1965)
Library
Blacksburg, Virginia 24061
University of Virginia
Alderman Library
Charlottesville, Virginia 22903
- Virginia Military Institute (1963)
Preston Library
Lexington, Virginia 22450

WASHINGTON

- Washington State Library (1970)
Olympia, Washington 98501

- Washington State University (1967)
Library

Pullman, Washington 99163
University of Washington
Library
Seattle, Washington 98105

WISCONSIN

- University of Wisconsin (1967)
Library
Green Bay, Wisconsin 54305
University of Wisconsin
General Library
Madison, Wisconsin 53706

WYOMING

- Wyoming State Library (1965)
Cheyenne, Wyoming 82001

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DISTRICT OF COLUMBIA

- The Army Library (1970)
Department of the Army
Washington, D.C. 20310
- Australian Joint Services
Staff (1970)
Washington, D.C. 20036
- George Washington University (1970)
University Library
Washington, D.C. 20006
The Library of Congress
Washington, D.C. 20540

• • •

PUERTO RICO

- Universidad de Puerto Rico (1966)
Biblioteca General
Rio Piedras
Puerto Rico

• • •

AUSTRALIA

- Australian National University (1968)
Institute of Advanced Studies
Library
Canberra, A.C.T.
Australia
- Commonwealth Parliamentary
Library (1968)
Canberra, A.C.T.
Australia
- Department of Defense Library (1969)
Canberra, A.C.T.
Australia
- National Library of Australia (1969)
Canberra, A.C.T.
Australia
- Macquarie University (1966)
Library
North Ryde, New South Wales
Australia
University of Sydney
Fisher Library
Sydney, New South Wales
Australia

CANADA

- University of New Brunswick (1969)
Harnet Irving Library
Fredericton, New Brunswick
Canada
- University of Guelph (1968)
Library
Guelph, Ontario
Canada
- Dalhousie University (1968)
Library
Halifax, Nova Scotia
Canada
- Hamilton Public Library (1969)
Hamilton, Ontario
Canada
- McMaster University (1968)
Mills Memorial Library
Hamilton, Ontario
Canada
- McGill University (1968)
Library
Montreal 2, Quebec
Canada
- Sir George Williams University (1969)
Library
Montreal, Quebec
Canada
- Carleton University (1968)
Library
Ottawa 1, Ontario
Canada
- Defence Research Board (1965)
Ottawa 4, Ontario
Canada
- Department of Supply
and Services (1968)
Library
Ottawa 4, Ontario
Canada
National Research Council
of Canada
National Science Library
Ottawa 2, Ontario
Canada
- University of Toronto (1968)
Library
Toronto 5, Ontario
Canada
- University of British Columbia (1970)
Main Library
Vancouver 8, British Columbia
Canada
- University of Waterloo (1970)
Library
Waterloo, Ontario
Canada
- University of Windsor (1970)
Library
Windsor 11, Ontario
Canada

ENGLAND

- University of Lancaster (1967)
Library
Bailrigg, Lancaster
England

National Lending Library
for Science and Technology
Boston Spa, Yorkshire
England

- Ministry of Defense (1967)
Library
Old War Office Building
Whitehall, London, S.W. 1
England
- Royal United Service Institution (1970)
Whitehall, London, S.W. 1
England

FRANCE

- Association Francaise pour
la Cybernetique Economique
et Technique
Library
Immeuble Centre Dauphine
Paris
France
- Organisation for Economic
Co-operation and Development
(1968)
Library
2, rue Andre-Pascal
Paris
France

GERMANY

- Universitätsbibliothek der
Technischen Universität Berlin
(1969)
1 Berlin 12 (Charlottenburg)
Germany
- Universitätsbibliothek der
Ruhruniversität (1967)
Zeche Klosterbusch
463 Bochum-Querenburg
Germany
- Stiftung Wissenschaft und
Politik (1966)
Haus Eggenberg
8026 Ebenhausen/Isartal
Germany
- Stadt- und Universitätsbibliothek
6 Frankfurt A.M. 1
Germany
- Bibliothek der Technischen
Hochschule und Technische
Informationsbibliothek (1968)
Welfengarten 1
Hannover
Germany
- Universitäts- und
Stadtbiobliothek Köln (1970)
Universitätsstrasse 33
5 Köln-Lindenthal
Germany

- Industrieanlagen-
Betriebsgesellschaft (1966)
Einsteinstrasse
8012 Ottobrunn bei München
Germany

INDIA

- Ministry of Defence (1967)
Defence Scientific Information
and Documentation Centre
Metcalfe House
Delhi-6
India
- Indian Council of World Affairs
(1966)
Library
Sapru House, Barakhamba Road
New Delhi-1
India
- Indian Institute of Public
Administration (1965)
Library
Indraprastha Estate, Ring Road
New Delhi-1
India

ISRAEL

- Israel Institute of Technology
(Technion) (1965)
Department of Industrial and
Management Engineering
Technion City, Haifa
Israel
- Hebrew University of Jerusalem
(1969)
The Harry S Truman Center for
the Advancement of Peace
Jerusalem
Israel
- Ministry of Defense (1966)
Government of Israel
Mamram Computer Center
Hakirya, Tel-Aviv
Israel
- Tel-Aviv University (1969)
The Leon Recanati Graduate
School of Business
Administration
Library
Tel-Aviv
Israel

ITALY

- Biblioteca Universitaria (1968)
35100 Padova
Italy
- Istituto per le Ricerche di
Economia Applicata (1968)
Futuribili
00187 Rome
Italy

JAPAN

- The Japan Economic Research Center (1970)
Nihon Keizai Shimbun Building, 1-chomee
Otemachi, Chiyoda-ku
Tokyo
Japan
- National Diet Library
No. 14, 1-Chome Nagata-cho
Chiyoda-ku, Tokyo
Japan
- Nomura Research Institute (1967)
KANAGAWA
Tokyo
Japan

JORDAN

- Royal Society for Scientific
Research (1966)
Amman
Jordan

LEBANON

- United Nations Economic
and Social Office (1969)
Beirut
Lebanon

PAKISTAN

- Defence Science Organization (1970)
Ministry of Defence
Rawalpindi
Pakistan

SPAIN

- Universidad Autonoma (1970)
Catedra Teoria Economica
Facultad de Ciencias Economicas
Madrid 7
Spain

SWEDEN

- Aktiebolaget Atomenergi
Library
Nykoping 1
Sweden
- Air Material Department (1968)
Documentation Centre
Stockholm 80
Sweden

THAILAND

- Asian Institute of Technology (1970)
Library
Bangkok
Thailand

SERIAL LIST

Reports

R-424-RC
R-443-RC
R-473-AID

Rand Memoranda

RM-2457-1
RM-2800-2
RM-3034-ISA
RM-3061-PR (Abr.)
RM-3079-PR
RM-3341-PR
RM-3384-PR
RM-3426-PR
RM-3432-PR
RM-3436-PR
RM-3449-ISA (Abr.)
RM-3472-RC
RM-3487-RC
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RM-3676-ISA
RM-3745-PR
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RM-3787-PR
RM-3817-NASA
RM-3825-RC
RM-3829-NASA
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RM-3856-RC
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RM-4379-AID
RM-4394-PR
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RM-4646-1-PR
RM-4666-1-PR
RM-4700-TAB
RM-4706-TAB
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Papers

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A study of bureaus and bureaucrats based on the premise that, as a species, bureaucratic organizations demonstrate predictable traits and habits. It is assumed that all bureaus have similar structures and survival instincts, and that most bureaucrats are basically rational and act in their own interests. The peculiarities, the conflicting and complex motives of real bureaucrats provide the data for the analysis. The typical life cycle of bureaus as they move from birth through growth to decline and eventual stagnation, rebirth or death is described. Bureaucrats are classified as five basic types—climbers, conservers, zealots, advocates, and statesmen—and the motivations and normal behavior patterns of each type are described. In contrast to the commonly held notion that a bureaucratic monolith is depriving men of their freedom, the average citizen of today enjoys a far greater range of choice of possible behavior than his predecessors. 307 pp. (Published by Little, Brown and Company, 1967, \$6.50. Available only from booksellers or the publisher.)

Book The Steel Industry of India. W. A. Johnson. 1966.

An analysis of India's expansion of its steel industry as a basic program in its overall development plans. Three specific questions are considered: Has India been justified in emphasizing iron and steel in its development plans? Is India expanding its steel industry in the most judicious manner possible? What lessons can be learned about industrial growth from a study of India's steel industry? The influence of the Indian government on the industry and on the economy in general is discussed and the economic and noneconomic objectives of Indian policy are examined. 355 pp. (Published by Harvard University Press, 1966, \$7.50. Available only from booksellers or the publisher.)

Book Rebellion and Authority: An Analytic Essay on Insurgent Conflicts. N. Leites, C. Wolf, Jr. 1970.

Economic reasoning applied to an analysis of rebellion and authority yields

some new conclusions about both. Fundamentally, the struggle for popular support is not exclusively or primarily a 'political' contest, as this term is usually understood. People act rationally, calculate costs and benefits, and choose sides accordingly. Successful rebels act on this assumption, applying discriminate force, coercing the populace into cooperation or compliance, and 'proving' authority to be not merely unjust, but a certain loser. Rebellion is a system and organizational technique. It can be countered, but not with rhetoric aimed at winning hearts and minds, and not necessarily with economic pump-priming. What's needed is organizational techniques to match the rebel drive—effective intelligence coupled with a discriminate use of force capable of obtaining compliance from the population. One major caveat: authorities are not invariably worthy of support from within or without, and careful calculation of ultimate interests should guide U.S. policy on this point. 186 pp. (Published by Markham Publishing Company, 1970, \$5.95. Available only from booksellers or the publisher.) (Also published as R-462-ARPA, February 1970.)

Book The Economy of the Chinese Mainland: National Income and Economic Development, 1933-1959. T. C. Liu, K. C. Yeh. 1965.

A quantitative study of the economic development of the Chinese mainland during 1952-1959, and a comparison of the changes over this period with the condition of the pre-Communist and prewar Chinese mainland economy in the 1930's. The method used is that of national income accounting: detailed estimates of domestic product by industrial origin, and domestic expenditures by end use are derived for the years 1933 and 1952-1957. Tentative estimates are offered for 1958-1959. Selection of the years covered and the details of analysis were determined by conditions in China and the availability and reliability of statistical data. 787 pp. (Published by Princeton University Press, 1965, \$10.00. Available only from booksellers or the publisher.)

Book Middle East Oil Crises and Western Europe's Energy Supplies. H. Lubell. 1963.

An examination of the probable effects of a range of possible Middle East crises on the energy supplies of our Western European allies, who in recent years have obtained close to 70 percent of their oil from the Middle East. It is argued that 'insurance' measures such as stockpiling coal and oil deserve more consideration by our allies than they have hitherto received. For the foreseeable future, however, the availability of American oil will remain the key to the situation. 233 pp. (Published by The Johns Hopkins Press, 1963, \$8.75. Available only from booksellers or the publisher.) (Also published by Rand as RM-2766-PR, April 1962.)

Book Strategy for R&D: Studies in the Microeconomics of Development. T. A. Marschak, T. K. Glennan, Jr., R. Summers. 1967.

The research and development process is examined in a study that explores the nature of the development project, alternative strategies that are available to a developer, and the procedure for allocating and reallocating resources as the project unfolds and information accumulates. Case histories of military developments illustrate the manner in which a sufficiently well integrated and suitably comparable group of histories might test hypotheses about the nature of development and about the relative performance of specified strategies for conducting development. Models are constructed to explore the elements of a normative theory of development—a process in which certain properties of the good conduct of development are deduced from precisely stated assumptions about the developer's goals and the techniques that are available to him for acquiring knowledge. 343 pp. (Volume VIII of the series *Econometrics and Operations Research*, Springer-Verlag New York, Inc., 1967, \$14.20. Available only from booksellers or the publisher.)

Book Technology, Economic Growth, and Public Policy. R. R. Nelson, M. J. Peck, E. D. Kalachek. 1967.

Focusing on technological knowledge as the key determinant of the rate of production and general economic progress, this study synthesizes recent data about the relation of research and innovation to economic growth. It analyzes the way in which technical advances occur, the impact of new technology on the economy, and the changes in governmental policy needed to stimulate technical advances and to make them socially productive. 251

pp. (Published by The Brookings Institution, 1967, \$6.00. Available only from booksellers or the publisher.)

Book Thinking About Cities: New Perspectives on Urban Problems. Edited by A. H. Pascal. 1970.

A collection of papers originally prepared for a 1968 workshop on U.S. urban problems, jointly sponsored by Rand and The Ford Foundation. The workshop's purpose was to define and initiate a comprehensive, long-term research program within Rand on urban policy issues and to interest other organizations in undertaking related work. Participants included scientists, scholars, federal and NYC officials, and Rand staff members. Contents, grouped thematically, cover (1) race relations in the city, (2) municipal objectives and organization, (3) the reform of urban programs, and (4) urban violence and public order. Specific consideration was given to recommendations for program initiatives, research, and experiments in education, health services, welfare: public assistance, jobs and manpower training, housing and urban planning, police services and public order, and municipal finance and administration. 198 pp. (Published by Dickenson Publishing Company, Inc., 1970, \$4.95. Available only from booksellers or the publisher.) (Also published by Rand as P-3868, August 1968.) (TC)

Book Democracy and Economic Change in India. G. Rosen. 1966.

A study of the political revolution in India in 1947 and the political, social, and economic changes that have followed. While greatest stress is on the economy, the author also aims to determine the relationship between the political and economic changes, particularly in the policy field where the relationship is closest. The author describes the established structure of Indian society at the time of independence, classifying the major economic and social groups within rural and urban India at that time. The next section describes the political changes arising from independence and from the ideological and institutional changes associated with it. This is followed by the economic section of the study, which examines the broad economic policies and their results from 1947 to 1961, estimating the economic gains and losses to the various class and caste groups. Next is a discussion of India's current economic problems and the implications of alternative policies for solving them. A final section applies certain generalizations on the relationship between political reform and economic change to other countries now in the process of development. 344 pp. (Published by University of California Press, 1966, \$6.75. Paperback edition, 1967, \$2.25. Available only from booksellers or the publisher.) (Also published as R-440-ISA, April 1966.)

Reports

R-424-RC Civil Aviation and U.S. Foreign Aid: Purposes, Pitfalls, and Problems for U.S. Policy. H. Heymann, Jr. January 1964.

A study of U.S. experience and policies in assisting civil aviation in underdeveloped countries, and a discussion of some concomitant major policy implications. This Report examines a broad range of U.S. foreign policy aims that this assistance can serve, and concludes that U.S. air programs have given too much attention to blocking Soviet aviation expansion and too little to the positive economic and social benefits inherent in the development of internal air transport. Also discussed are practical problems to be overcome in designing more effective assistance projects. 98 pp.

R-443-RC African Agriculture in Rhodesia: An Econometric Study. B. F. Massell, R. W. M. Johnson. June 1966.

An analytical and empirical examination of the factors responsible for agricultural underdevelopment in Rhodesia. The analysis is based on survey data from two agricultural areas, Chiwesha Reserve and Mt. Darwin Native Purchase Areas. Production functions are fitted for each of the three major crops in each area, using analysis of covariance. Management is explicitly introduced into the production function. Results and implications of the study are presented. The authors suggest that, although the analysis is based on specific factors in Rhodesia, it may be relevant to agricultural problems throughout Africa, and possibly to other parts of the underdeveloped world. 138 pp.

R-473-AID A Crisis of Ambiguity: Political and Economic Development in the Philippines. H. Averch, F. H. Denton, J. E. Koehler. January 1970.

Survey of findings on the social, political, and economic state of the Philippine nation. Analysis indicates that among the less-developed countries, the Philippines is not a nation in a general massive social crisis. Classical metaphors about the polity and economy of less-developed countries are misleading when applied to the Philippine experience. The country has a stable democracy, has a modernizing economy growing at a real rate of 6 percent, and does not appear particularly susceptible to revolution from either the right or the left. None of this means, however, that the country is performing spectacularly or that it has no problems. The nation does have specific ills (poverty, Huk dissidence, unemployment, violence, periodic balance-of-payments problems) but none appear unmanageable. However, appropriate, specific policy responses will depend on a much closer articulation of information systems with decisionmaking. 342 pp. Ref. (TC)

Rand Memoranda

RM-2457-1 Soviet Bloc-Latin American Economic Relations and United States Policy. A. O. Hirschman. May 1967.

Revision of a 1959 analysis of the possible effects of an expansion of Soviet Bloc economic relations with Latin America and the implications for U.S. policy in the event that such an expansion should occur. An increase in trade between the Soviet Bloc and Latin America could result in a decrease in Soviet influence, particularly in those Latin America countries where Soviet performance does not meet the unrealistic expectations of new and inexperienced leaders. Soviet maneuverability might also be affected adversely by greater involvement. Any Soviet Bloc attempts at penetration and infiltration, by trade or by other means, might best be countered by improving the U.S. position in Latin America. U.S. influence is not commensurate with the high degree of U.S. financial involvement in the Latin American economy; new approaches could be explored in a reappraisal of U.S. commodity, investment, and development-assistance policies. The success of present efforts toward Latin American economic integration would increase Latin American ability to resist Soviet penetration. The principal features of the Soviet Bloc-Latin America trade, 1953-1958, are discussed. 51 pp.

RM-2800-2 Economics Department Publications, 1948-1962: An Author Index of the Open Literature, with Abstracts. H. Porch. January 1967.

The title of this Memorandum describes its content. 153 pp.

RM-3034-ISA Tactics in a Local Crisis. A. R. Ferguson. September 1962.

A model of the interrelationships among strategic, tactical, economic, and political factors involved in pursuing a nation's interests in cases of local aggression against it or its allies. The analysis deals specifically with the manipulation of the West's military and other assets in local crises so as to improve the West's bargaining position and its relative power position. The Memorandum explores conditions under which forceful actions can be taken with little risk of extensive violence, seeks to identify means to control escalation in the event of violence, and describes the general characteristics of moves suitable for the West in a number of substantially differing political and military situations. 136 pp. (See also RM-3034-ISA (Abr.).)

RM-3061-PR (Abridged) Cost Estimates as Predictors of Actual Weapon Costs: A Study of Major Hardware Articles. R. Summers. March 1965.

A statistical study of military cost estimates intended to be helpful in assessing the probable accuracy of cost estimates for major hardware articles of military systems still in development. Based on a sample of 68 cost estimates of major hardware articles in 22 weapon systems, it assesses their accuracy as predictors of actual costs. It is believed that the methods presented here provide a sensible way of using our imperfect information about the past to decrease the uncertainties about future hardware costs. This Memorandum is an abridgment rather than a revision of the original Memorandum (April 1962). Nothing new has been added, but certain classified material has been deleted. 83 pp.

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RM-3079-PR Disaster and Recovery: A Historical Survey. J. Hirshleifer. April 1963.

An investigation of economic characteristics of some major disasters and recoveries of modern times. Four periods are covered in detail: Russian war communism, 1917-1921; the American Confederacy, 1861-1865; Japan, pre and post World War II; and Germany, pre and post World War II. Emphasis is on the mechanism of collapse, whether the source was technological or organizational, and on what forces promoted or hindered recovery. 139 pp.

RM-3341-PR The USSR and the West as Markets for Primary Products: Stability, Growth, and Size. E. Neuberger. March 1963.

An evaluation of Soviet claims that the Communist countries, by virtue of their central planning and rapid growth, represent much more attractive markets for primary-product exports from underdeveloped countries than do the allegedly stagnant and unstable economies of the West. It is found that the Soviet market not only falls short of the perfection claimed for it by the Soviets, but is, when compared to Western markets, neither large nor particularly stable. Soviet claims of rapid growth in primary-product imports are, however, fully confirmed by the data. 168 pp.

RM-3384-PR Soviet Expenditures on Scientific Research. Nancy Nimitz. January 1963.

A presentation of data on the financing of Soviet R&D from 1928 through the 1962 Plan, together with background information on the organization and growth of the research establishment. The Memorandum concentrates on expenditures since 1950, particularly on unidentified outlays from the budget allocation to research of national importance. Trends in the distribution of budget outlays on research of national significance suggest that the identified portion supports the Academy of Sciences and other nonindustrial research institutions, while the unidentified or 'classified' portion consists mainly, if not entirely, of outlays on industrial research. If this interpretation is correct, research directly addressed to space and defense problems must be concentrated in 'classified' outlays (along with some civilian industrial research of high priority). 77 pp.

RM-3426-PR Strategic Ambiguity, Asymmetry and Arms Control. Some Basic Considerations. H. Averch. March 1963.

An examination of some novel arms control questions that have arisen during Project Rand research on central war strategies. It is pointed out that some types of arms control agreement may be used as a tool by the Soviet Union to achieve strategic objectives undesirable to the United States, even if there is adequate inspection and verification that the terms of the agreement are being carried out. Assuming conditions between the United States and the USSR similar to those existing at present, it may be difficult to distinguish between a case in which the Soviet Union seeks superiority and a case in which both sides seek stable deterrence. Furthermore, it is rational for the Soviet Union, if it seeks superiority, to engage in some types of arms control agreements with adequate inspection, provided some of the existing Soviet force becomes superfluous as new weapons are phased in. 33 pp.

RM-3432-PR Export Concentration and Fluctuations in Export Earnings: A Cross-Section Analysis. B. F. Masseil. March 1963.

An analysis of the relationship between the fluctuations of a country's export earnings and the concentration of its exports. In a sample of 36 countries, regression analysis is used to estimate the relationship between the instability of a country's export earnings and the commodity concentration of its exports. Also considered are the geographical concentration of exports and the ratio of primary-product exports to total exports. It is concluded that in general neither diversification nor industrialization is likely to reduce

greatly the amplitude of fluctuations in a country's export earnings. 44 pp.

RM-3436-PR Economic Viability After Thermonuclear War: The Limits of Feasible Production. S. G. Winter, Jr. September 1963.

A study of certain aspects of the question of how, and under what circumstances, the resources surviving a thermonuclear war could be used to create an economy capable of supporting the population, maintaining its capital stock, and meeting other urgent national needs. The main focus is on the limits imposed on production in the postattack economy by the availability of resources and the technological conditions. The reorganization problem is treated as being synonymous with the problem of achieving a viable economy. A solution to the problems of making effective use of surviving resources is satisfactory only if it is permanent. No predictions are made of the course of economic events after a war; instead a range of situations is considered and discussed in terms of production limits, rather than of actual outcomes given particular organizational arrangements. Some tentative judgments are made on the levels of attack at which viability would become unlikely without preattack preparations. 240 pp. Bibliog.

RM-3449-ISA (Abridged) Methods for Improving Coordination Between Economic and Military Aid Programs. C. Wolf, Jr. March 1963.

A consideration of the relationship between military and economic assistance programs. The Memorandum discusses how the differing planning cycles for economic and military aid programs can be meshed to facilitate coordination between the programs. The discussion is based on information available up to April 1962. 34 pp.

RM-3472-RC Submarine Telephone Cables and International Telecommunications. R. T. Nichols. February 1963.

A brief study of the network of submarine telephone cables. Since the first transAtlantic cable was completed in 1956, the network has been expanding rapidly in world coverage and circuit capacity. The development of the cable systems is discussed, together with their role in providing transoceanic telecommunication facilities. The competition that a future communications satellite might offer is analyzed. 42 pp.

RM-3487-RC Communications Satellites: Technology, Economics, and System Choices. S. H. Reiger, R. T. Nichols, L. B. Early, E. Dews. February 1963.

A study of the key problems of communications satellite systems. The economic problem is one of demand, for even the minimum cost of such a system will be large. The technological problem is one of reliability, for replacement costs must not become prohibitive. Cost estimates are made for stationary and nonstationary systems and an evolutionary approach is suggested. Since stationary satellites would likely be adopted if sufficiently reliable, a limited global system could begin with simple random satellites in mid-altitude orbits using currently available launch vehicles. Such a system could start to earn revenues almost immediately, first for transAtlantic service and later in world-wide use. Possible locations for the ground stations for early regional and global networks are shown. 114 pp.

RM-3520-PR Soviet National Income and Product in 1965: The Goals of the Seven Year Plan. A. S. Becker. March 1963.

A comprehensive calculation and analysis of the USSR's national income and product as planned by the Soviets for 1965. Soviet National Income and Product (SNIP) accounts and detailed estimates of investment in the Seven Year Period are used to view the various growth and resource-allocation objectives of the Seven Year Plan. On the basis of the incomplete data available, it seemed highly unlikely that the Plan would be fulfilled as a whole. The state budget revenues were growing at a rate below that planned and were inadequate to meet the rapidly rising requirements for outlays for R&D, the military, and investment expenditures. On the other hand, inventory investment had already increased far more rapidly than planned. A continuation of these trends would undoubtedly mean a 1965 pattern of resource use and activity levels substantially different from those originally planned or expected. 249 pp.

RM-3532-PR Input-output and Soviet Planning: A Survey of Recent Developments. A. S. Becker. March 1963.

A discussion of the increasing interest shown by the USSR in the application of tools of mathematical economics of Soviet planning and economic organization. This interest constitutes a radical shift from the attitude of bitter hostility characteristic of the Stalin era. Undoubtedly, much of the change can be explained by a desire to rationalize the cumbersome Soviet economic apparatus. The evolution of Soviet activity in the field of input-output studies is analyzed. It is shown that after considerable experience in handling large-scale studies, Soviet planners are still far from being able to apply even simple static models to the task of assuring consistent plan objectives. Further developments will depend largely on the particular resolution found for such sensitive issues of economic policy as the principles of correct pricing and centralization versus decentralization in economic organization. 36 pp.

RM-3540-PR Production of Food Crops on the Chinese Mainland: Pre-war and Postwar. T. C. Liu, C. Twanmo, K. C. Yeh. January 1964.

An assessment of Communist claims of increased agricultural output since 1949. The Memorandum reconsiders the prewar surveys of Chinese agriculture conducted by C. C. Chang and J. L. Buck, and attempts to derive a new and more accurate set of estimates for the production of certain important food crops. On the basis of these new estimates, it is concluded that the Communists have considerably exaggerated the difference between prewar and postwar output. 67 pp.

RM-3586-ISA Savings and the Measurement of 'Self-help' in Developing Countries. C. Wolf, Jr. April 1963.

Description of a method of assessing the degree of self-help present in developing countries. Gross domestic saving is selected as one important measure of self-help. Several regression models are formulated. They hypothesize that gross savings depend on gross national product, per capita gross national product, urbanization, and international trade. Data for 30 to 34 less-developed countries are used in the models. It is concluded that savings estimates are a useful indicator of what countries should be capable of doing for themselves. 38 pp.

RM-3629-PR Soviet Bloc Economic Integration: Some Suggested Explanations for Slow Progress. E. Neuberger. July 1963.

An attempt to explain the relatively slow progress in economic integration within the Soviet Bloc. Despite the avowed Soviet Bloc goal of achieving economic integration, and despite the existence since 1949 of the Council of Mutual Economic Assistance (CEMA) as a mechanism for implementing this goal, the Bloc appears to have made less progress toward full economic integration than have the countries of Western Europe—notwithstanding the seemingly ideal preconditions that the governments share a common ideology and have complete control over their economies. Some major factors impeding successful economic integration within the Bloc are discussed. 31 pp.

RM-3664-1-FF Recent Land-use Trends in Forty-eight Large American Cities. J. H. Niedercorn, E. F. R. Hearle. September 1963.

An examination of changes in the proportions of various types of land in urban use. A full set of the data regarding land use, population, and employment; used in the analytical part of this Memorandum is included in the appendixes. The landuse data were collected from the city planning commissions of the 48 cities; the employment and population data are estimates made by the authors. To their knowledge, it is the most nearly complete set of such data in a single publication. 48 pp.

RM-3676-ISA The Political Effects of Military Programs: Some Indications from Latin America. C. Wolf, Jr. June 1963.

A study to formulate as verifiable hypotheses some of the views that have been advanced in public discussion of the political consequences of military aid to underdeveloped countries. The several hypotheses are then subjected to various crude tests on the basis of rough data dealing with the Latin American countries. Although important qualifications and reservations

must be attached to these data, and hence to tests that use them, the study suggests that there are no significant relationships in general terms between (a) either the scope of authoritarian institutions and practices or the changes in them, and (b) the size of U.S. military assistance programs or of domestic defense programs in these countries. 41 pp.

RM-3745-PR The European Soviet Bloc and the West as Markets for Primary Products. E. Neuberger. September 1963.

An assessment of the validity of the Communist argument that the countries of the Soviet Bloc, by virtue of their central planning and rapid growth, represent better markets than Western countries for primary products of underdeveloped areas. The present study analyzes five members of the Bloc (Bulgaria, Czechoslovakia, East Germany, Hungary, Poland) and concludes that they comprise a relatively small but rapidly growing market for raw materials, which is of no more than average stability. 69 pp.

RM-3758-RC An Improved Econometric Model of Metropolitan Employment and Population Growth. J. H. Niedercorn. October 1963.

A description of an econometric model designed to explain the growth of employment and population in 36 of the nation's largest metropolitan areas. The mode is formulated, estimated, and tested. Forecasts made with it indicate that population and employment growth will be rapid in most of these areas. Central cities will become increasingly specialized in white-collar employment, while blue-collar employment will tend to move to the suburbs. Increased commuter traffic between the central city and its suburbs is likely in a majority of the 36 metropolitan areas. 47 pp.

RM-3787-PR Sino-Soviet Economic Relations, 1958-1962. O. Hoefliding. August 1963.

An examination of information relevant to Sino-Soviet economic relations through mid-July 1963, in six parts: (1) a brief introduction to China's economic crisis, emphasizing that formal economic relations between China and the Soviet Union have been preserved; (2) a review of the peak period in Sino-Soviet trade, 1958-1959; (3) the period of heavy decline, 1960-1962; (4) developments in 1962-1963; (5) implications for China, the world's largest underdeveloped country, one of the poorest and virtually the only one not receiving economic aid from any source; and (6) a postscript concerning an 'open letter' on the Sino-Soviet dispute published in mid-1963 by the Soviet Communist Party. 30 pp.

RM-3817-NASA Overseas Telecommunications Traffic and Commodity Trade. R. L. Slighton. October 1963.

A brief statistical analysis of the assumption that the growth of overseas telecommunications traffic has been, and will continue to be, intimately connected with the growth of overseas commodity trade. The record since 1950 does not support the view that trade expansion is a principal cause of the long run (1950-1960) increase in telephone traffic. For telegraph traffic, however, trade is apparently a much more satisfactory explanatory variable. In the short run, changes in the volume of trade account for a large part of the year-to-year changes in both telephone and telegraph overseas traffic. 61 pp.

RM-3825-RC Communist China's Foreign Trade: Price Structure and Behavior, 1955-1959. F. Mah. October 1963.

An analysis of Soviet and Western data to test the validity and explore the economic meaning of Peking's claim that prices in its trade with the Soviet Union have been 'reasonable and fair.' Average unit values of selected commodities traded between Communist China and the USSR for the years 1955-1959 are compared with the unit values of similar commodities in Russia's trade with its European satellites and in Communist Chinese and Soviet trade with free countries. The data are limited, but for the commodities covered it appears that there is a 'China differential' unfavorable to the Chinese. Some tentative explanations are offered for the observed differential. 141 pp.

RM-3829-NASA Telephone Rates, Queues, Costs: Some Economic Implications for Analyzing Fluctuation Demands. J. R. Minnsian. September 1963.

A presentation of a general theory of queues for telephone services. The importance to this theory of the level and structure of relative prices charged for a service is demonstrated, and the theory itself is applied to the problem of multiple access in satellite communications. Both implicit and explicit price differentials are analyzed. It is shown that the costs of communication services depend on, among other things, the price structure of the services, and therefore on the pattern of queues already in existence. 37 pp.

RM-3831-NASA The Market for Overseas Telecommunications in 1970. R. L. Slighton. September 1963.

An inquiry into the size and configuration of the market for overseas telecommunications services in 1970. The total capacity requirement for routes involving the United States is estimated at 55-70 per cent of the figure given by the 1961 *Ad Hoc* Carrier Committee. But the main difference between these two forecasts lies in the estimates given for certain bulk routes, which in some cases run as low as 25-40 per cent of the committee's estimate. Most of the capacity requirement on overseas routes in 1970 will derive from demand for telephone service; the effective demand for overseas televisual transmission will probably be limited to certain off-peak hours. Submarine cable systems will supply a substantial portion of the anticipated requirements; but, for various reasons, a communication satellite system designed to meet the needs of 1970 is likely to need substantial multiple access capabilities. 72 pp.

RM-3856-RC Exports, Capital Imports, and Economic Growth. B. F. Massell. January 1964.

In a paper published in 1962, R. J. Ball presented a theoretical examination of the effect of exports and of capital imports on an economy's rate of growth. Ball concluded that capital imports enable an economy to increase its rate of growth without incurring any debt burden and that an increase in exports may reduce the rate of growth. The present study examines the model and the assumptions underlying Ball's conclusions. Both of his conclusions are found to follow from quite unacceptable assumptions; a more realistic set of assumptions yields entirely different results. 16 pp.

RM-3877-NASA High-capacity Submarine Telephone Cables: Implications for Communication Satellite Research and Development. R. T. Nichols. October 1963.

An assessment of the implications of transistorized cables for communication satellite research and development. The Memorandum surveys the development of submarine telephone cables and then examines the assumption that satellites would be more economical than conventional communications facilities for long distance, over-water, large capacity circuits. It is pointed out that satellite circuits cost the same overseas as overland; on the other hand, submarine cable circuits probably cost no more than landline circuits in many areas of the world, and only twice as much in the U.S. The Memorandum suggests that initially at least, satellite R&D should be directed toward providing a few channels connecting a great many stations rather than a great many channels connecting only a few stations. 52 pp. Bibliog.

RM-3880-RC East African Economic Union: An Evaluation and Some Implications for Policy. B. F. Massell. December 1963.

A study of the East African common market composed of Kenya, Uganda, and Tanganyika. The Memorandum assesses the gains and losses resulting from the operation of this common market, both from the point of view of East Africa as a whole and that of the three participants individually, considers the gains likely to result from continuation of the market, in either its present or an expanded form; evaluates several measures that might improve its performance; and suggests a course of action for the East African governments. 104 pp. Bibliog.

RM-3886-PR Soviet Military Outlays Since 1955. A. S. Becker. July 1964.

A survey and elaboration of open-source information on the growth of total Soviet military outlays since 1955. As the first detailed review of what is and is not known about Soviet military outlays, the study may also contribute to the discussion on budgetary disarmament. The starting point of the analysis is the explicit Soviet budget allocation to 'defense.' After concluding that additional military outlays, over and above this defense appropriation, must be presumed to exist, the rest of the Memorandum is devoted to the estimation of concealed expenditures and the evaluation of these estimates. 119 pp. Bibliog.

RM-3901-ISA The Political Effects of Economic Programs: Some Indications from Latin America. C. Wolf, Jr. February 1964.

Conjectures about the relations between economic development and political effects have been a long-standing part of the foreign aid debate. As background for the empirical work discussed in this Memorandum, some of these conjectures are summarized. Several of the hypotheses are then tested in a preliminary way, using indicators of political development in Latin America and a number of economic indicators relating to the Latin American countries from 1950 to 1960. These indicators are: (1) total U.S. economic aid and per capita aid; (2) average annual GNP and per capita GNP; (3) annual gross investment and per capita investment; (4) gross investment as a proportion of GNP; and (5) annual rate of growth in GNP and in per capita GNP. The meaning and interpretation of the test results are then summarized. 45 pp.

RM-3903-PR Some Simple Models of Arms Races. M. D. Intriligator. April 1964.

A simplified study of the complex structure of arms races in the real world by the assumption of two contenders, each having one policy variable: weapons stocks. With such simplification, arms races are studied by means of reaction curves that indicate optimal weapons stocks, given the weapons stocks of the opponent. The ratio goal and Richardson models are formulated in terms of reaction curves. Allowance is made for the neglect of strategy and constraints by these models. The analysis is suggested only and does not consider the many dimensions of policy. 28 pp.

RM-3912-PR Aggregate Production Functions and Medium-Range Growth Projections. R. R. Nelson. December 1963.

An analysis and comparison of several different but related aggregative models of long-run economic growth. A general model is developed which includes the various models as special cases. This broader model is used to explore different explanations of the 1929-1960 growth record of the American economy, and various projections for growth in the 1960s. 67 pp.

RM-3945-PR International Division of Labor in CEMA: Limited Regret Strategy. E. Neuberger. December 1963.

The second in a series of studies attempting to explain the slow progress of Soviet economic integration. This Memorandum deals in greater depth with the economic obstacles to further integration in the Soviet sponsored Council of Economic Mutual Assistance (CEMA), and outlines the approach being followed by CEMA members in their attempts to attain a division of labor. 24 pp.

RM-3968-PR On Decisionmaking in Large Organizations. W. M. Jones. March 1964.

An attempt to view the problems of military command and control systems in the context of organizational decisionmaking processes. Decisionmaking in a large military organization is intimately associated with the very complex communications process between individual decisionmakers. It is significantly different from the processes whereby an individual makes decisions. The characteristics of the organizational decision process can be described by categorizing the intraorganizational communications process as occurring at three levels: the formal, the subformal, and the personal. Each of these levels has an important role in the decision process. 33 pp.

RM-4010 RAND Corporation Publications Relevant to Economic Development--a Selective Bibliography. F. T. Moore, C. Spokenman. March 1964.

A selective bibliography on economic development, including its related problems in the political, sociological, and technical areas. 50 pp.

RM-4059-PR Technical Progress in Two-Sector Models. V. D. Taylor. April 1964.

A theoretical exposition of models used in studying technical progress in an economy. The study compares *shared* technical progress (benefits go to all machines regardless of their age) with *embodied* technical progress (benefits go only to new machines incorporating technical advances). It assumes progress at constant exponential rates but allows for rate variation between sectors. It derives solutions for a model where (1) persons desire to save a fraction of gross income, (2) uncertainty is absent, and (3) lifetimes of machines are economically determined. 157 pp. Bibliog.

RM-4091-ISA The Course of U.S. Private Investment in Latin America Since the Rise of Castro. L. L. Johnson. May 1964.

The rise of Castro in Cuba and the spread of his influence in other countries have generated concern that the over-all private investment climate in Latin America has deteriorated, that private capital flows from the United States will continue to fall, and that the goals set in the Alliance for Progress for foreign private investment will not be met. This study is concerned, first, with investigating the pattern of investment flow in recent years. Second, it treats several possible explanations for the pattern that does emerge from the empirical analysis. Third, it relates this analysis to the role of U.S. private investment in the Alliance for Progress. The statistical analysis discloses that little if any decline in aggregate direct investment has taken place in recent years. 48 pp.

RM-4092-ISA U.S. Private Investment in Latin America. Some Questions of National Policy. L. L. Johnson. July 1964.

Employing historical empiricism and theoretical analysis, this Memorandum examines various economic-political side effects of U.S. private investment in foreign countries--side effects that might have adverse effects on relations between the host countries and the U.S. Presuming that large economic benefits do accrue to host economies from the U.S. investment, the study explores the nature and sources of conflict that can arise between host countries and U.S. investors and lead to the involvement of the U.S. government. From this analysis, the study identifies a number of relevant issues in formulating future U.S. national policy toward American private investment abroad. 97 pp. Bibliog.

RM-4127-PR Soviet Government Grain Procurements, Dispositions, and Stocks, 1940, 1945-1963. Nancy Nimitz. November 1964.

An accounting of that portion of Soviet grain output delivered to the government (up to one-half of annual output). The Memorandum presents estimates of the allocation of government grain resources among current domestic uses, exports, and stockpiling, in 1940 and all postwar years. Estimates are derived from open literature available at the beginning of October 1964, and consider data on output of grain products, grain storage capacity, rail shipments, and human consumption of grain and the foods likely to be substituted for it in periods of austerity or abundance (potatoes and livestock products). Main discussions center about (1) the attitude toward reserves--the extent to which other objectives are sacrificed to accumulate them or are served in the short term by running them down; (2) the extent to which government assumes responsibility for redistributing grain supply within the agricultural sector. 124 pp.

RM-4186-RC The Impact of Urban Renewal on Land-use. E. F. R. Hearle, J. H. Niedercorn. June 1964.

An examination, using data from 297 urban renewal projects in 102 cities, of changes in the mean proportions of land in various uses, before and after renewal. Within project areas, the major impact of renewal is to double the land area devoted to industry and to triple the area used for public purposes.

Residential area is sharply reduced; commercial area increased; and street area left about the same. 35 pp.

RM-4202-PR Simulation of Decisionmaking in Crises. Three Manual Gaming Experiments. H. Averch, M. M. Lavin. August 1964.

A description of how gaming techniques have been used in examining three hypothetical European crises occurring in the late 1960s. This gaming has sought to identify political and military constraints affecting decisionmaking, to discern any common patterns of action, and to infer military requirements in crises. On the basis of this experience, the Memorandum advances observations and judgments about: (1) effects of game structures on decisionmaking, and the quality and quantity of game decisions compared with those in real crises; (2) escalation of violence in games as opposed to real crises; (3) impact of internal and external information flows in game decisions; and (4) questions deserving further study. 42 pp.

RM-4250-PR The Cost of Basic Research Effort. Air Force Experience, 1954-1964. E. D. Brunner. February 1965.

It has long been apparent that the costs of basic research have been increasing. The extent, however, of the increases and their incidence among the several elements of cost, the various scientific fields, and the different types of research organization have largely been matters of conjecture. Thus, it has been difficult to discover the real level of research effort financed by AFOSR from year to year, or to determine what level of funding would be required for any given desired scale of effort. This study is a first attempt to provide information, useful for planning and budgeting, on the costs of accomplishing basic research projects financed by the USAF Office of Aerospace Research, Office of Scientific Research, during FY 1954-1964. 65 pp.

RM-4264-PR Soviet Transport and Communications: Output Indexes, 1928-1962. N. M. Kaplan. November 1964.

An attempt to assess the role of transportation and communication (the aggregate performance of which has not been measured before) in the Soviet Union's over-all economic growth. The primary method is by comparison between output and input increases in transport and communications, and by comparison between the U.S. and the USSR in this and other economic areas. 69 pp. Bibliog.

RM-4264-PR (Supplement) Soviet Transport and Communications: Output Indexes, 1928-1962. N. M. Kaplan. November 1965.

This Supplement to RM-4264-PR, published November 1964, extends the Soviet output indexes to 1963 and amends some of the results in the original study. 16 pp.

RM-4291-AID A Note on Foreign Assistance and the Capital Requirements for Development. R. N. Cooper. February 1965.

An examination of some dimensions of 'efficiency' in aid giving. The Memorandum is an exercise in optimization, given the need to conserve resources in the donor, and given the objective of raising real national income in the recipient. On grounds of efficiency it is desirable to maximize the grant equivalent to the recipient per dollar grant equivalent from the donor. The view adopted in the present study is that the proper application of external resources will raise output in most poor countries by more than the same resources will raise output in the developed countries. 45 pp.

RM-4297-ISA An Economic Theory of Alliances. M. Olson, Jr., R. Zeckhauser. October 1966.

Presents a new theoretical model of military alliances and other international organizations. The assumptions basic to the model are that nations act in their own best interests and that there is a 'public goods' aspect to all joint undertakings. The main conclusions drawn from the analysis are that (1) a less than optimal amount of resources will be devoted to an alliance or other international organization, (2) the burden of an alliance will be borne in a disproportional way, the larger members paying more than their proportional share. Empirical data from NATO and the United Nations are presented in support of these conclusions. 47 pp.

RM-4330-PR Some Aspects of the Allocation of Scientific Effort Between Teaching and Research. M. D. Intriligator, B. L. R. Smith. March 1966.

An analysis of the allocation of new scientists between teaching and research. The study uses an analytic framework built on specified policy objectives and a model for the allocation of new Ph.D.'s in science between the two areas. Some simplifying assumptions lead to a general welfare function for this aspect of a national science policy. Special cases of the general welfare function, including minimization of the time required to attain a given scientific capability, are treated explicitly. The production of new scientists is determined in the model by a production function, dependent on teaching scientists and on time. 29 pp.

RM-4363-PR Defense Contracts: An Analysis of Adaptive Response. O. E. Williamson. June 1965.

A study of the methods by which the Air Force and other government departments can keep development contract costs within reasonable bounds. The role of task uncertainty in the problem of contract cost control is emphasized, and it is argued that in many situations the adaptive responses of the firm can vitiate the effects of contractual arrangements aimed at reducing costs through profit-sharing incentives. The analysis concludes that one of the most effective ways to strengthen cost controls is to reduce the task uncertainty associated with contract negotiations. An adaptive response model is presented in an appendix. 73 pp. (See also RM-2482-PR, RM-2948-PR.)

RM-4377-RC Problems, Limitations, and Risks of the Program Budget. R. N. McKean, M. Anshen. January 1965.

This Memorandum studies potential disadvantages that must be considered whenever improved program budgeting arrangements are introduced. Progressive redesign of innovations is recommended to cut costs and increase gains. The authors note that excessive centralization could lead to loss of flexibility, neglect of alternatives, and failure to take uncertainties into account. Diversity rather than uniformity is needed in program budgeting. (Chapter 10 in book, *Program Budgeting*, edited by D. Novick, Harvard, 1965.) 30 pp.

RM-4379-AID A Possible U.S. Policy Towards Indian Transportation: An Illustration of Improved Sectoral Policies. A. Carlin. June 1965.

A discussion of the merits of the sectoral approach as a supplement to present AID methods in assessing the amount and kind of assistance to be given to lessdeveloped countries. The author concludes that more sectoral studies are needed, and shows how useful sectoral policies can be developed by applying existing economic theory to critical issues in the allocation of resources within a sector. The method is illustrated by a suggested U.S. policy towards Indian transportation. 81 pp. Bibliog.

RM-4394-PR Soviet National Income and Product, 1958-1962: Part I--National Income at Established Prices. A. S. Becker. June 1965.

Part of a larger study on Soviet national income during the Seven Year Plan period (1959-1965). The Memorandum estimates and analyzes national income and product in the USSR for the years 1958-1962. Valuation is at current, established prices. A subsequent Memorandum will present adjustments of the estimates for distortions in the price system and for changes in price levels. The accounting framework is described and estimates of the major income and outlay aggregates are critically examined and tested. Implications of the estimates are considered under the heading of sources of household incomes, consumer spending patterns, the structure of public sector revenues, the scope of the state budget in relation to GNP, and trends in over-all resource allocation. 220 pp. Bibliog.

RM-4623-PR Farm Employment in the Soviet Union, 1928-1963. Nancy Nimitz. November 1965.

Estimates of employment on private, collective, and state farms (excluding the war years), in man-days and in annual averages or equivalents in the Soviet Union. Emphasis is on the private and collective sectors, for which

Soviet sources do not provide complete or consistent data. Besides comparing the estimates with other published series, and showing what they imply with regard to over-all labor productivity in agriculture, the Memorandum comments on utilization of collective farm labor, and assembles data bearing on incentives to work on the private plot (incomes of collective farm households from their plots compared with earnings for collective work, trends in the terms of trade, direct taxes, and other elements of government policy affecting the plot). 164 pp. Bibliog.

RM-4640-PR The Common Market and European Unification. R. T. Nichols. December 1965.

A study of the Common Market: its past problems, current difficulties, and future possibilities. The study consists of seven sections, each of which may be read independently: (1) an introduction to the Common Market; (2) the Common Market and internal trade; (3) external economic policies of the European Economic Community; (4) the European Free Trade Association; (5) prospective members of the European Economic Community; (6) European Economic Community agriculture; and (7) the Common Market and European political unification. Statistical tables showing import and export data of the Common Market countries are appended. 122 pp. Bibliog.

RM-4646-1-PR Bureaucratic Structure and Decisionmaking. A. Downs. October 1966.

An analysis of the behavior of bureaucratic organizations in a wide variety of situations and a definition of bureaus as organizations. The study has three central axioms: (1) all social agents pursue their goals rationally and efficiently; (2) the internal structure and operations of each bureau are greatly influenced by the nature of its social functions; and (3) bureau officials are motivated at least in part by their own self-interest, even when performing official duties. Officials are divided into five types; namely climbers, conservers, zealots, advocates, and statesmen. The study explores how bureaus behave in a realistic world where information is costly and uncertainty exists. Facets of bureau behavior are examined extensively. Several testable hypotheses about bureau behavior under various circumstances are presented. 183 pp.

RM-4666-1-PR Civil Aviation in Communist China since 1949. H. Porch. December 1968.

A report of the development of Mainland China's civil aviation since the Communist takeover. China's political goals of increased agricultural and industrial output have resulted in specialized aviation taking precedence over transport services. Although some strides have been taken in providing a rapid means of communication between provincial capitals and industrial cities and in supplying materials and personnel to remoter regions, CAAC (Civil Aviation Administration of China) has concentrated its efforts domestically-serving the needs of agriculture, forestry, and industry, and providing freight and passenger service. Statistics for civil aviation in China since 1966 show some changes in organization and scheduling directly attributable to the Cultural Revolution. Probably due to the self-imposed semi-isolationism and lack of long-range aircraft, development of international routes has not been extensive. 111 pp. (KB)

RM-4700-TAB Disaster and Recovery: The Black Death in Western Europe. J. Hirschleifer. February 1966.

A discussion of the Black Death of 1348/1350 in Western Europe and its aftermath as a disaster-recovery experience. Described are: (1) the immediate social, political, and economic effects of the first decade, and (2) possible effects during the century following the initial plague disaster. 40 pp. Bibliog. (See also RM-3079-PR, RM-3436-PR.)

RM-4706-TAB Sensitivity of Mortality Estimates to Uncertainties in Some Nuclear Damage Parameters (Part I). M. E. Arnsten. November 1966.

A survey of some of the varying estimates of parameters that describe the lethality of radiation and nuclear prompt effects, and an evaluation of these variations in the context of hypothetical thermonuclear attacks on the United States. Charts show the ranges of mortality estimates from three counterforce attacks as the following are varied: mid-lethal radiation dose.

biological recovery parameters, mid-lethal overpressure for prompt effects, fission fraction, gamma activity level, wind patterns, and distribution of radioactivity with debris particle size. The use of uncertain mortality estimates in the analysis of a few representative defense problems is briefly discussed. 126 pp. Refs.

RM-4707-TAB Sensitivity of Mortality Estimates to Uncertainties in Some Nuclear Damage Parameters (Part II) M. E. Arnsten. November 1966

A series of ninety-five graphs enables the reader to explore the sensitivity of attack outcomes to uncertainties in some nuclear damage parameters in the context of three hypothetical counterforce attacks on the United States. These graphs permit the reader to select his own estimates of mid-lethal radiation dose, biological recovery parameters, mid-lethal over pressure for prompt effects, fission fraction, gamma activity level, and distribution of radioactivity with debris particle size and then to calculate, for the three attacks, the corresponding mortality estimates. Wind patterns and civil defense postures can also be varied. 146 pp.

RM-4744-AID/ISA (Supplement) Security and Assistance in Thailand. Supplement on the Thai 'Rice Premium' H. Heymann, Jr., G. Rosen, V. D. Taylor, D. A. Wilson, C. J. Zwack. December 1965.

A discussion of the rice premium and agricultural policy in Thailand. The effects of the rice taxes on the farmer, on retail prices, and on government revenues are described. It is concluded that economic incentives are distorted and production retarded, and that the burden of the rice tax is borne not by the farmer alone, but by all of Thailand. 26 pp.

RM-4794-AID Problems of Industrialization in Chile: Some Preliminary Observations. L. L. Johnson. December 1965.

A progress report on the effects of government development policy, inflation, and exchange control on industrialization in Chile. It examines the difficulties encountered in seeking to combine economic and political objectives by stimulating the growth of a domestic automobile industry in the unstable northern region, only to find much of the expected economic benefits lost because of a seasonal employment pattern in which plants are idle half the year. The study shows that: (1) under Chile's complicated foreign exchange control system, even inefficient firms can remain in business (with high costs and profit margins passed on to the consumer); (2) the demand for credit far exceeds the supply; and (3) excess industrial capacity in Chile arises in part from gross imperfections in the capital market caused by an inflationary monetary policy, frozen nominal interest rates, and exchange controls. 40 pp.

RM-4881-PR Soviet National Income and Product, 1958-1962: Part II--National Income at Factor Cost and Constant Prices. A. S. Becker. May 1966

The second and concluding part of a study of Soviet national income in 1958-1962. Part I (RM-4394-PR, June 1965) presented estimates of national income at actual (or established) prices of the respective years. Part II adjusts the estimates at established prices for distortions in the Soviet price system, in effect revaluing output at factor cost, and deflates both the established-price and factor-cost estimates for changes in the general price level. The revalued data at current factor cost are discussed in terms of changes in the structure of resources, i.e., while the estimates at constant prices serve for analysis of economic growth. The calculations are compared with official Soviet claims and with estimates of other non-Soviet studies. Some implications of the author's results are considered in relation to the problem of the slowdown of Soviet growth. 216 pp. Bibliog.

RM-5057-PR Innovation and Product Quality Under the Total Package Procurement Concept. T. K. Glennan, Jr. September 1966

An assessment of the potential impacts of the Total Package Procurement Concept (TPPC), introduced in the C-5A program, on innovation in new developments and on the quality of the resulting systems. One of the tentative conclusions is that TPPC seems most likely to have adverse effects in situations where the requirement is uncertain, the need is extremely urgent,

the technology is unproved, or the measures of system effectiveness are diffuse and qualitative. 33 pp.

RM-5125-PR An Econometric Study of International and Interindustrial Differences in Labor Productivity. E. J. Mitchell. December 1966.

An explanation of observed differences in output (value added) per man among developed countries and manufacturing industries. Statistical factor analysis is introduced and applied to derive a new production function which distinguishes between skilled and unskilled labor. Assuming competitive markets for goods and labor, identical production functions, and similar relative prices in all countries, differences in productivity and relative wages are shown to be explained by the relative proportions of the highly skilled workers. Examination of rates of return on capital suggests that capital tends to be mobile among countries. Therefore, countries well endowed with skilled labor should export goods produced in skill-intensive industries. 106 pp. Refs.

RM-5181-ARPA (Abridged) Land Tenure and Rebellion: A Statistical Analysis of Factors Affecting Government Control in South Vietnam. E. J. Mitchell. June 1967.

A statistical analysis to determine those factors that explain variation in the degree of government control in the provinces of South Vietnam. An analysis of social and economic data reveals that a greater degree of government control is associated with greater inequality in land tenure. A secure province in South Vietnam is one in which few peasants work their own land, distribution of land holdings is unequal, land redistribution has not been carried out, large French landholdings have existed in the past, population density is high, and the terrain is such that mobility and accessibility are low. The greater power of landlords and the docility of peasants in these relatively feudal areas may account for the situation. 38 pp.

RM-5182-PR Innovation and Military Requirements: A Comparative Study. R. L. Perry. August 1967

A detailed examination of two major innovations in military aeronautics--turbojet propulsion and the variable-sweep wing--using the classical economic investment model. Three phases of the innovation process are distinguished: invention or conception, demonstration of feasibility, and acceptance or adoption. Patterns of innovation characterizing the evolution of jet engines and of variable-sweep wings tend to resemble one another. Both devices showed deficiencies in the feasibility demonstration phase, but efforts to overcome those for jets began immediately, while those of the variable sweep were neglected until alternative technologies had been exhausted. Even then, the military was slow to acknowledge the value of an operational application of the swing wing. All evidence suggests that once an innovation reaches the stage where appraisal is appropriate, technical feasibility demonstrations should be conducted as quickly and cheaply as possible. Feasibility should not be subordinated to an existing requirement, but the requirement should be built around the demonstrated capability of the innovation. Wartime stresses encourage early exploitation of innovations, but during peacetime the military must have more compelling evidence of technical feasibility before investing in novel devices. 92 pp. Refs.

RM-5227-1-PR/ISA The Economics of Nuclear Reactors for Power and Desalting. W. E. Hoeft, Jr. November 1967.

An evaluation of the prospects of nuclear power plants and dual-purpose nuclear power-desalting plants in various foreign countries, based on an analysis of present and prospective nuclear and conventional economics. A broad assessment of trends in U.S. prices and costs forms the basis for much of the evaluation. Major uncertainties still exist in forecasting future capacity and estimating nuclear generating costs, and costs of dual-purpose plants, both here and abroad. In less-developed countries, these uncertainties are compounded by technological difficulties associated with small, undercapitalized, and poorly interconnected utility systems. When alternative generating methods for underdeveloped countries are considered, the feasibility of nuclear power becomes doubtful. Economic feasibility studies undertaken by impartial organizations are needed to determine whether nuclear power is a rewarding area for U.S. economic assistance. 249 pp.

RM-5275-PR The Cost of Basic Scientific Research in Europe: Department of Defense Experience, 1956-1966. E. D. Brunner. April 1967.

An analysis of the cost of basic scientific research obtained in Europe and Israel from 1956 through 1966 by agencies of the Department of Defense. Cost-sharing agreements with European institutions and grants have prevented the average cost of research agreements from rising between 1961-1962 and 1965-1966. In the case of non-cost-sharing agreements, however, the cost has increased throughout the entire period. An analysis of the average cost per scientist per man-month for all types of research reveals that the cost of basic research obtained in the United States in 1965 ranged from three to four times the cost in Europe. 59 pp.

RM-5310-PR/ISA Latin American Defense Expenditures, 1938-1965. J. E. Loftus. January 1968.

An analysis of Latin American defense expenditures, 1938-1965. The study is based on data published in the United Nations *Statistical Yearbook*. All data have been reduced to constant 1960 U.S. dollars. Defense spending reached a peak level of \$1.4 billion in 1958, declined thereafter to about \$1.2 billion, and turned upward in 1964 and 1965 to about \$1.4 billion. Contrary to the commonly held view that Latin American defense spending has increased tremendously since the late 1930s, these measurements suggest at most a doubling—significantly less than the increase experienced by other countries. The hypothesis that Latin American defense spending is importantly affected by domestic political instability and fears of border conflicts is examined. Suggestions are made for future research and for improving the data reporting system of the Agency for International Development. 148 pp. Refs. (LK)

RM-5393-AID Urban Unemployment in Colombia: Measurement, Characteristics, and Policy Problems. R. L. Slighton. January 1968.

An analysis of the dimensions and characteristics of urban unemployment in Colombia. About 10 percent to 16 percent of the labor force in the larger cities are unemployed, and unemployment is increasing. It is four to six times greater than it was 15 years ago. The unemployment rate is likely to double within the next 6 to 7 years if Colombia's future rate of growth of output is the same as its historic rate. The urban unemployed are younger than the employed and less educated; however, the relationship between unemployment and education is weak. There is no evidence to suggest that the rising unemployment rate is the result of a large increase in the number of unemployed migrants who have come from the countryside to the cities. Two important conclusions emerge from the study: (1) The urban unemployment problem is sufficiently important to warrant increased effort in the collection of data concerning its magnitude. (2) Urban unemployment is a more serious problem today than it was 3 years ago, and, unless there is a sharp change in the rate and pattern of growth of total output, it will become an even more pressing economic problem in the near future. 78 pp. (See also RM-5412-AID.)

RM-5405-RC/AID A Family Planning Hypothesis: Some Empirical Evidence from Puerto Rico. T. P. Schultz. November 1967.

An analysis of the hypothesis that the frequency of births in a population can be understood in terms of three factors that influence the desire for births: (1) a family size goal that is determined by characteristics of the environment; (2) the incidence of death among offspring; (3) the effect of uncertainty in the family formation process. The hypothesis implies that these factors determine the average level of preferred birth rates and that they exert a systematic effect on actual births in following periods. These implications are tested by empirical evidence from Puerto Rico for the 1890's and 1950's by juxtaposing birth rates and environmental variables that include mortality, education, and the economic activity of women and children. The association between birth rates and environmental variables is consistent with the implications of the hypothesis. Other factors that are not accounted for by the family planning model are also considered as sources of variation in birth rates: urbanization, agricultural activity, age/sex, and marital status. These factors do not emerge as significant when the other variables of the family planning model are also considered. 85 pp.

RM-5412-AID A Study of Industrialization in Colombia: Part I, Analysis. R. R. Nelson. December 1967.

Part I of a two-part study on Colombian industrialization describes three key characteristics of Colombia's manufacturing sector that contribute to the country's economic difficulties: low productivity; a structure that is heavy on consumer goods industries and light on intermediate and capital goods industries; and the small size of the manufacturing sector relative to the total economy. The interaction of these three characteristics poses a problem that is compounded by the falloff in coffee export earnings and a failure to develop major new sources of nonmanufacturing export earnings. The study shows that low productivity in industry could take care of itself to a considerable extent if the modern subsectors could expand rapidly. However, this would require imports and a large amount of capital, which would have to come from two sources: foreign exchange and domestic savings. The analysis suggests that increasing domestic savings would tend to cause a rise in unemployment due to curtailed activity in consumer goods industry, but that an increase in foreign exchange would permit the modern sector of Colombia's manufacturing industry to be expanded without high unemployment. 86 pp. Refs.

RM-5530-PR The Legacies of Central Planning. E. Neuberger. June 1968.

An analysis of a centrally planned economy (CPE) in an attempt to isolate those 'legacies' that ultimately impede transition to a freer, more productive economy capable of participating in an international division of labor. In a CPE, centralization is both an important policy objective and a *modus operandi* and has certain positive consequences, such as freedom from market instabilities, a more equitable distribution of income, higher education and skill levels, and the ability to channel capital investment. Some of these may be imperfectly realized, however, and there are some inherent negative consequences as well: for example, administrative rigidity and inefficiencies, irrational pricing, arbitrary exchange rates, and production and quality control problems. In spite of growing dissatisfaction in many areas, the problems in foreign trade are the ones that finally force a change in the system. The difficulties experienced by Yugoslavia in the area of foreign trade, after 15 years of attempting to move toward a 'visiole hand' regime with worker self-management, are an indication of the strength of some of these negative legacies. 71 pp.

RM-5603-RC Cities in Trouble: An Agenda for Urban Research. Edited by A. H. Pascal, S. Genensky, W. A. Johnson, D. F. Loveday, I. S. Lowry, R. Rosenkranz, D. Weiler, C. T. Whitehead. August 1968.

An examination of the problems of the cities and a proposed agenda for research in urban housing, employment, welfare, public order, and health services. This study is the result of contributions prepared by members of the RAND staff following a Workshop on Urban Problems financed by the Ford Foundation and The RAND Corporation. Little systematic data on American cities exist and there is an inadequate catalog of policy alternatives and of the consequences that may result from the choice of particular alternatives. The unsolved problems of the cities are not likely to respond to superficial attacks with limited resources. Solid analytical work is a prerequisite to successful programs. In the effort to solve the problems of the cities, universities and private research organizations have a role to play in work that cuts across disciplinary lines—gathering data in the field as well as in the library, and maintaining and renewing an openness to ideas. Even the most effective research will not be enough to solve the problems of the cities, but, without it, those problems will not be resolved even in part. 166 pp.

RM-5625-PR/ISA Chinese Industrial Growth: Brief Studies of Selected Investment Areas. F. M. Cone. May 1969.

An analysis of productivity in the principal Chinese industries contributing to construction and to the production of the 'hard' goods associated with the acquisition of other 'fixed capital.' This includes the bulk of military equipment and a small amount of goods produced for the consumer market. The data are derived for the years 1952 through 1957, the only period for which the data are sufficient to permit a comprehensive study. (Some later data are considered for both the steel and machine-building industries.) The examination of these industries suggests a tendency toward overstatement

of achievements, particularly in regard to steel output, construction, and capital investment in railroads and coal mining. The "profit" rate in investment industries was extremely high, if the iron and steel, machinebuilding, electric power, and coal-mining industries were weighted by employment, this rate would average about 7 times the wage bill or some 5 times the U.S. ratio 117 pp. Refs. (See also RM-5662, RM-5841.) (MP)

RM-5631-DOT Putting the Analysis and Evaluation of Traffic Safety Measures into Perspective. M. Wohl. April 1968.

An appraisal of the benefits and costs of traffic safety measures, both in aggregative and differential terms. Operationally, the traffic safety problem is to determine the aggregate levels of benefit and cost associated with the adoption of safety measures and to determine who will benefit from these measures and how much and who will pay for them and how much. An examination of three safety measures—seat belts, side-marker lights, and controls on drinking drivers—shows that: (1) safety per se should not be viewed in isolation, (2) society should not regard safety as a necessary good regardless of all else, (3) governmental intervention or control is not always necessary and in some cases may tend to undermine the public welfare; (4) the mere lack of safety progress on the part of the automotive industry does not indicate a lack of proper motives; (5) equity issues surround the traffic safety problem. 51 pp. (See also RM-5632-DOT, RM-5633-DOT, RM-5634-DOT, RM-5635-DOT, RM-5636-DOT, RM-5637-DOT.) (BG)

RM-5632-DOT A Conceptual Framework for Evaluating Traffic Safety System Measures. M. Wohl. April 1968.

A description of a conceptual framework for evaluating traffic safety system measures and a discussion of the research required to make the system analysis and evaluation framework operational. An evaluation of a traffic safety action requires that a value be placed on the adverse, beneficial, present and future effects of the action. A benefit-cost analysis reveals that the most economically worthwhile plan will be the one that has the highest nonnegative net present value. Six research categories have been established to provide a format for analyzing and evaluating safety actions: accident prediction; criticality prediction; severity prediction; market behavior, cost and resource commitment prediction and valuation; and travel forecasting. Although these categories are not mutually exclusive, they conform to the current stratifications of the traffic safety system and provide a mechanism for judging worth, priority, and time-sequencing of the research. 38 pp. (See also RM-5631-DOT, RM-5633-DOT, RM-5634-DOT, RM-5635-DOT, RM-5636-DOT, RM-5637-DOT.) (LK)

RM-5634-DOT Vehicle Safety: Why the Market Did Not Encourage It and How It Might Be Made To Do So. A. Carlin. April 1968.

An analysis of the reasons why the market mechanism has not proved effective in promoting vehicle safety and of possible ways that market forces might be used to create a greater demand for safety in the future. Because consumers have shown little interest in vehicle safety features and because manufacturers have found that safety doesn't sell, the market has not operated to raise safety standards. This situation might be changed (1) by increasing the public's ability to distinguish the relative safety of different models of cars by either a hierarchy of easily understood Federal vehicle safety standards or by direct comparisons or ranking of relative vehicle safety or (2) by creating greater incentives for the public to demand safer cars or to install and use safety equipment. 28 pp. (See also RM-5631-DOT, RM-5632-DOT, RM-5633-DOT, RM-5635-DOT, RM-5636-DOT, RM-5637-DOT.) (BG)

RM-5645-RC/AID Returns to Education. Colombia. T. P. Schultz. September 1968.

A study of the rate of return, in terms of wages, to various levels of education for men and women in Bogotá. Based on data obtained from a labor force survey in Bogotá in September 1965, estimates are derived for the private rate of return and for a partial social rate of return (based on an estimate of the average public cost per student at various school levels). Although the data are cross-sectional, and educational planning is concerned with the long-range view, the results do provide evidence for some rough indications of economic priorities. The study shows, for example, that whereas the rate of return to both men's and women's secondary and vocational education,

and to some extent men's primary education, is high, the return to university training is unusually low. Thus, high priority should probably be given to the expansion of secondary and vocational schooling, with emphasis on achieving a more equal distribution of educational opportunity between urban and rural, rich and poor regions. On the other hand, continued expansion of higher education without rapid growth in domestic demand for high-level talent may only accelerate emigration of university graduates, already a matter of concern. 77 pp.

RM-5651-RC/AID Relative Wages, Skill Shortages, and Changes in Income Distribution in Colombia. R. L. Slighton. October 1968.

An analysis of the income distribution relative to the economic growth in Colombia. Distribution of income in Colombia has been, and is, very unequal: 10 percent of the population of the large cities receives about half of the total personal income. This study examines the hypothesis that this inequality will widen if growth of the modern sector of the economy is retarded after the transition from agrarianism to the dual economy is begun. In Colombia, this increase in inequality resulted from the combined effect of an increase in unemployment, an increase in the wage differential between subsectors of the economy characterized by changing technology (modern) and subsectors where technology is static (traditional), and a rate of growth of employment in the modern subsectors that is less than in the traditional subsectors. The widening wage differential between the modern and traditional subsectors is a result of more intensive educational differences, and of differences in the competitive structure of the labor and product markets. This pattern of change of income distribution may alter if population growth is controlled, if export (hence import) capabilities are developed, and if labor force quality is upgraded to allow for modern subsector domination of the economy. 75 pp. (EB)

RM-5662-PR/ISA Chinese Industrial Growth: Investment Outlays, 1952-1957. F. M. Conc. May 1969.

An analysis of data on Communist China's industrial investment during the period 1952-1957, presented in terms of national accounts and in U.S. dollars. In spite of the limited quantity and relatively low quality of available data, it is still possible to make a few statements with a fairly high degree of certainty. (1) The economy was heavily dependent on imports, which accounted for about 20 percent of the gross domestic investment. (2) Nearly one-quarter of the total investment consisted of additions to inventory. (3) Construction activity accounted for some two-thirds of total fixed investment, a rather high proportion considering the small volume of residential construction during the period. The tendency of construction outlays to outrun equipment purchases becomes even more evident when the results are converted into U.S. equivalents. In dollar terms, construction accounted for some 85 percent of fixed investment, as compared with 67 percent in yuan terms. 50 pp. Refs. (See also RM-5625, RM-5841.) (MJP)

RM-5680-AID The Effective Exchange Rate, Employment, and Growth in a Foreign Exchange Constrained Economy. R. R. Nelson. November 1968.

An analysis of how the effective exchange rate—the price of foreign exchange relative to domestic factor prices—influences the balance of payments constraint and, hence, Colombia's ability to achieve faster growth and higher employment. The conventional two-gap models lead to the pessimistic conclusion that Colombia cannot increase its growth rate without increases in foreign assistance and, therefore, that the level of the effective exchange rate is not of particular policy concern. A model is developed that admits the possibility of substituting domestic inputs for both intermediate and capital goods imports, demonstrating that Colombia has far more room to maneuver than the two-gap models suggest. The price of this maneuverability is an effective exchange rate. This, in turn, suggests that, since the fall in coffee prices, the target effective exchange rate may have been set too low, given Colombia's employment and growth objectives and reduction in foreign exchange supply. 65 pp. (MJP)

RM-5682-RC Economic Policy-Making with Limited Information: The Process of Macro-Control in Mexico. J. E. Koehler. August 1968.

An analysis of the manner in which the Mexican government has achieved macroeconomic stability in spite of the seemingly inaccurate and crude

information and policy instruments at its disposal. This stability is due, in part, to the public expenditure and private autonomous expenditure having moved in offsetting ways. However, this pattern is not the result of fiscal policy, since the information on which such a policy would have to be based is lacking. Thus, it is private investment that is being forced to adjust to the movements of public expenditure. The only policy tool that is manipulated frequently and with sufficient power to control private investment this effectively is the ratio of reserves private banks are required to deposit with the central bank, Banco de Mexico. Because the government deficit is closely linked to the supply of money, and the supply of money is, in turn, closely linked to the balance of payments, the need for a change in policy is quickly signaled to the authorities. In Mexico's circumstances, buying a monetary control capability appears adequate to achieve reasonable short-run stability. However, the policy will not be adequate forever. 75 pp. Bibliog.

RM-5705-PR Soviet National Income, 1964-1966, in Established Prices. S. Anderson. September 1968.

Estimates based on Soviet data but following Western accounting procedures. The main tables cover household incomes and outlays, the gross-national-product account, and the distribution of GNP by use. Total GNP rose from 232 billion rubles in 1964 to 270 billion in 1966. The distribution of GNP remained fairly stable on both the income and outlay sides of the accounts. However, there were slight declines in the shares of fixed capital investment and the explicit budget allocation to defense. 109 pp. Refs.

RM-5743-OEO Evaluating Federal Manpower Programs: Notes and Observations. T. K. Glennan, Jr. September 1969.

A discussion of the use of evaluations of manpower training programs by OEO in planning and policymaking. The experience of past and present manpower programs should be a valuable source of data to guide the development and planning of future programs. The major problem to be overcome in an evaluation of program impact is finding a reference or control group with which to compare the work experiences of the program enrollees. Even if such a group is found, the results of evaluations cannot be compared because of inconsistent analytical assumptions. Suggested measures for improving the relevance and usefulness of evaluations are (1) to use longitudinal study designs, (2) to make new programs more experimental, (3) to establish analytic conventions for conducting benefit-cost studies, (4) to improve information systems at the local level, and (5) to increase cooperation between evaluators and policymakers. 55 pp. Bibliog. (CD)

RM-5746-OEO Appraising Selected Manpower Training Programs in the Los Angeles Area. L. P. Holliday. April 1969.

A summary of the principal theoretical and empirical findings of Rand studies for the Office of Economic Opportunity on manpower programs in the Los Angeles area with suggestions and recommendations for the design of future manpower programs. The emphasis is on the problems of devising a methodology for evaluating manpower programs. Future evaluation efforts should seek findings related to program decisions and should develop new methodologies, data systems, and criteria for future evaluation of alternatives. One of the five data systems examined, the 'Extension Zero' system, appears to have potential for supporting local decisionmaking and, if widely used, national evaluative analysis. Some of the recommendations are to conduct a longitudinal study, to seek low-cost sources of follow-up data for evaluation, to consider computer-based information systems, to focus job development on promising firms, to develop standards for cost-benefit studies, and to examine youth program goals. In addition, the study suggests two demonstration projects: a computer-based, reactive data system similar to 'Extension Zero' and an experimental manpower project using the experience gained to date. 41 pp. (See RM-5739-OEO, RM-5740-OEO, RM-5741-OEO, RM-5745-OEO.) (MJP)

RM-5757-ARPA The Huk Rebellion in the Philippines: An Econometric Study. E. J. Mitchell. January 1969.

An analysis of the regional pattern of Huk control in the Philippines in terms of certain cultural, economic, and geographic variables. The Huk movement, which began as a socialist-communist anti-Japanese guerrilla army in 1942, posed a serious military threat to the Philippine Republic after the War. The Huks declined sharply after 1950 but have risen again and control a large

number of barrios in Central Luzon, especially in the Province of Pampanga. In this study, an econometric model is constructed to examine the regional variation of Huk control in terms of economic, cultural, demographic, and geographic variables. The results indicate that the key factors are (1) language: a barrio is more likely to be Huk controlled if most of its residents speak the Kampampangan dialect; (2) sectionalism: the movement takes advantage of ethnic divisions; (3) location: barrios are susceptible to Huk control if they lie near those already under control or near areas conducive to guerrilla operations; (4) proportion of tenant farmers: the Huk movement fails in areas where there are few farmers or where few farmers are tenants. The fact that the communist movement began among the Pampangan-speaking people is probably historical coincidence and is not an indication that this group is inherently more revolutionary than others. 29 pp. (See also RM-5181ARPA.) (EB)

RM-5765-AID/RC Population Growth and Internal Migration in Colombia. T. P. Schultz. July 1969.

An analysis of Colombia's population explosion and increased internal migration. In recent years, Colombia has experienced one of the world's most rapid population growth rates and an unprecedented migration from rural to urban areas. An analysis of interregional differences in fertility reveals that urbanization and rising incomes may not in themselves reduce birth rates or impede population growth; however, wide dissemination of basic education, improved employment for women, and better child and health services may reduce fertility indirectly. Rural-to-urban migration is largely understood in terms of the rates of population growth and concurrent agricultural wage levels. If the underlying causes for this migratory process remain constant for the next decade, the rate of rural-to-urban migration is likely to rise. If the urban unemployment problem worsens, however, this process will likely be self-limiting. Internal migration performs an important function in a country's economic development, and corrective policy should not try to curb it to relieve urban unemployment; rather, a demand for labor should be promoted in both the rural and urban sectors. 114 pp. (EB)

RM-5780-RC/AID Supply Response in the Colombian Coffee Sector. M. J. Bateman. October 1969.

The coffee industry in Colombia, which accounts for 8-9 percent of national income and is the largest source of foreign exchange, is beset with a continuing production surplus that is of great policy concern to the government. This Memorandum formulates an econometric model of the supply of Colombian coffee to use in estimating how the coffee industry would respond to price incentives to lower production. Empirical results obtained from the model suggest that (1) changes in price do not affect the intensity of harvesting, (2) there are lags of 5 years between price changes and 7 years between production changes, and (3) the elasticity of coffee supply with respect to price is about 0.5. These findings imply that a 20 percent reduction in producer prices would lead to a 10 percent reduction in coffee production, but only after 7 years. 55 pp. Bibliog. (See also R-461.) (CD)

RM-5815-PA Alternative Development Strategies for Air Transportation in the New York Region, 1970-1980. H. S. Campbell, A. Carlin, S. L. Katten, T. F. Kirkwood, D. M. Landi, R. E. Park, L. Roennau, A. J. Rolfe. August 1969.

An overview of some possible avenues of development for New York's air transportation system from now until 1980. Three ways of adding to the system's capacity are investigated: (1) continuing to operate mainly from the present three airport sites; (2) developing new capacity for the short- and medium-length-of-trip market; and (3) constructing a fourth major airport 40 or 50 miles from Manhattan. The three alternatives are compared in terms of major investment outlays, time phasing of capacity additions, and vulnerability to forecast errors. The analysis indicates that expansion in the next several years will be limited to the type envisioned by the V/STOL system, e.g., creation of a major STOL port near mid-Manhattan. If a program of peripheral and V/STOL airports can be developed to serve a significant portion of air travel in the area, the need for a fourth airport may be delayed. However, it may be wise to acquire ownership or control of a site as soon as possible. 84 pp. Refs. (See also RM-5816, RM-5817, RM-5818, RM-5819.) (CC)

RM-5817-PA The Efficient Use of Airport Runway Capacity in a Time of Scarcity. A. Carlini, R. E. Park. August 1969.

An examination of the extent and nature of the airplane delay problem and alternative short-term policies to increase the efficiency of runway use. Relevant data, mainly from the three major New York airports for the period April 1967 through March 1968, are investigated and a simple queueing model is presented. Calculations show total delays during the one-year period of 3.3 million minutes at Kennedy, 9 million at La Guardia, and 7 million at Newark. Efficiency could be improved by a system of proportional marginal cost pricing, which would change the basis for runway use fees from aircraft weight to hour of day, and by administrative measures involving elimination of some or all general aviation. A combination of these strategies would be even more efficient, as would a policy of issuing short-term permits during particular hours according to use. 265 pp. (See also RM-5815, RM-5816, RM-5818, RM-5819) (CC)

RM-5841-PR/ISA Chinese Industrial Growth: Overall Level of Investment and Its Relation to General Growth Rate. F. M. Cone. May 1969.

An evaluation of the investment ratio and overall economic growth in Communist China during the First Five-Year Plan period, 1952-1957. Estimates of a growth rate between 6 and 9 percent, supported by a massive investment ratio of 25 percent and an industrialization level approaching that of contemporary Japan and the United States, are highly questionable, even if its basic Chinese data are accepted. The investment ratio and growth rate are revalued to achieve greater comparability with those of other countries. The resulting calculations suggest an investment ratio of 10 or 12 percent for 1957 and an overall growth rate of 3 percent for the period. (See also RM-5625PR/ISA, RM-5662-PR/ISA.) 98 pp. Refs. (CD)

RM-5844-PR Present-Value Calculation Aids: The Case of Loans and Grants. D. F. Loveday. March 1970.

A set of charts (nomograms) and an alternative disc slide rule calculator to compare military or nonmilitary assistance loans and grants for the purpose of determining (1) the proportion of each that is a gift, (2) the burden to the lender, and (3) the actual gain to the recipient. This quick, easy hand-calculation method is particularly suited for use during aid negotiations and conferences. Input data consist of the loan interest rate (which can be zero), grace period, payment intervals, and the value of capital—the rate of return available from market-oriented investments with a similar risk of nonrepayment. For the value of aid to the receiver, the value of capital is equal to the best investment opportunities for the loan/aid funds. If two or more donors are engaged in burden-sharing negotiations, the value of capital may be determined by agreement. 40 pp. (MW)

RM-5891-OEO Youth and Work: Toward a Model of Lifetime Economic Prospects. S. J. Carroll, A. H. Pascal. April 1969.

An analysis of the conceptual issues in research on youth employment embodied in a general, dynamic model consisting of a system of simultaneous equations. The model is based on the presumption that a youth's economic prospects are a consequence of three sets of interacting variables, summarized as experience, perceptions, and opportunities. Equality of economic opportunity is, essentially, a long-run concept. The extent to which an individual suffers from inequalities in economic opportunity depends on his economic prospects at various points in time. Therefore, the relations between behavior at a point in time and opportunity over time are developed. The model examines a number of phenomena that have been offered as explanations of the unsatisfactory economic future confronting low-income urban youth. The implications for policy analysis and program evaluation are explored at length. Research priorities are suggested and data availability and requirements are discussed. 62 pp. Bibliog. (MJP)

RM-5957-PR The Delphi Method, II. Structure of Experiments. B. Brown, S. W. Cochran, N. C. Dalkey. June 1969.

A compilation of the experimental designs, questionnaires, and resulting group response data representing the raw materials of a Rand evaluation of Delphi procedures. (Analysis of the data and major conclusions are presented in RM-5888.) The Delphi technique uses an anonymous, orderly

program of sequential individual interrogations, with controlled feedback from respondents between interrogations, to elicit and refine group judgments where exact knowledge is unavailable. Ten experiments involved university students as subjects and posed questions of almanac-type information having numerical answers. The overall aim was to explore how groups use incomplete information to arrive at factual conclusions. Different experiments tested different hypotheses. One was designed to compare the relative accuracy of group answers obtained by the Delphi questionnaire-feedback method with those obtained by a structured, face-to-face discussion. 136 pp. Bibliog. (CD)

RM-5961-FF Economic Development in Egypt. B. Hansen. October 1969.

An examination of the growth potential of the Egyptian economy. Within the context of present political uncertainties in the Middle East, this study investigates the problem of whether Egypt will be able to return to a path of sustained growth, what measures will have to be taken for that purpose, and what factors will govern and limit its growth. Assuming that Egypt's economic development will be based primarily on her own resources and efforts, this study offers projections of levels of income and production for the years 1980 and 2000: a 6 percent growth rate of the GNP and a 2.5 percent population growth. Given favorable external conditions and good domestic management, these projections imply that by the year 2000 the average Egyptian could enjoy an income and standard of living equal to that of an average Greek of today. Moreover, Egypt should be able to keep per capita income growing at a rate of about 3.5 percent per year. 104 pp. (KB)

RM-5962-FF The Maghrib and the Middle East. C. F. Gallagher. July 1969.

This study explores the relationship between Tunisia, Morocco, and Algeria and the Middle East. A geographically compact and culturally unified area, the Maghrib (North Africa) has had familiar but uneasy relations with the Middle East. Its strong linguistic and religious ties to the Arab Middle East are attenuated by the pervasive legacy of French culture. This duality is reflected in the economic infrastructures and sociocultural outlooks of these nations, and indeed is what distinguishes the Maghrib from the Arab Middle East. Tunisia and Morocco have maintained close ties with France while seeking counterbalances to its influence. Algeria has turned away from its Maghrib neighbors to the Middle East, and away from the West to the Soviet bloc. Despite the myth of Algeria's military victory against impossible odds, neither Algeria nor any other North African nation can aspire to the leadership of the Arab world: they are too physically and spiritually removed. Should a new Arab-Israeli war break out, the North African countries are likely to play only a subsidiary role. 39 pp. (CD)

RM-5964-FF Economic Development in Syria. B. Hansen. December 1969.

A look at past economic development in Syria and a discussion of expected future growth, along with potential obstacles. Syrian oil production will be the most expansive factor in the economy, coupled with anticipated industrial agricultural benefits from power and water to be supplied by the Russian-built Euphrates Dam project. An annual growth rate in the national product of 5 to 6 percent is possible. But coups, revolutions, and the imposition of Egyptian-style socialism have paralyzed private investment initiative. Agriculture is stagnant. Unless the windfall from oil is used to create conditions for future large-scale manufacturing, and unless vigorous efforts at importing technical know-how and boosting agricultural productivity are made, the long-term outlook for economic development may be bleak. 61 pp. (TC)

RM-5966-FF Regional Arab Politics and the Conflict with Israel. M. H. Kerr. July 1969.

An analysis of aspects of the relations among the Arab states that have inhibited them from following more effective policies toward Israel. In spite of the arguments in favor of pan-Arabism offered by Arab political and intellectual leaders, the problem of unity cannot be separated from the practical diplomatic interests of diverse Arab states. Egypt, the most powerful of these, possesses distinct national needs and attitudes that do not always accord with those of the others. In addition to disunity, Arab policy

toward Israel has been affected by a lack of military, economic, and diplomatic support, and by their failure to decide clearly and realistically on their longrange objectives in the war. The actions of the individual Arab states toward each other and toward Israel in the next decade can be expected to feel the impact of the 1967 war, most probably through the exacerbation rather than the amelioration of strife that has continued over the past twenty years. 57 pp. (KB)

RM-5967-FF The United Arab Republic: The Domestic Political and Economic Background of Foreign Policy. M. H. Kerr. August 1969.

A discussion of the foreign policy of the UAR in terms of its domestic political situation and conceptions of international alignments. In large measure, Egyptian foreign policy in the last two decades has not been the special product of President Nasser's regime, but rather has rested on a longstanding expectation on the part of the Egyptians that they should exercise some form of hegemony in the eastern Arab world. The ideological atmosphere that has grown up around the program of the revolutionary regime reflects the actions of various factions and groups within Egypt. Clearly, nationalism has created pressures for internal modernization and for a vigorous pan-Arab and international role for the UAR. It is evident that the instability in UAR's conception of its international alignments has resulted from the conflicting aspirations and insecurities among the various elements of which the regime must take account, including elements within its own ranks. 49 pp. (KB)

RM-5968-FF Factors Influencing Iran's International Role. L. Binder. July 1969.

An investigation of the economic and political aspects of life in Iran as they relate to her role in Middle Eastern and international affairs. In the past 10 years, Iran has become increasingly capable of playing a strong and assertive international role, particularly with regard to her politico-military influence in the Middle East. The chief reason for this change is the achievement of a high level of domestic tranquility under the political supremacy of the Shah, who has managed to gain extensive control, achieve political stability, institute far-reaching reforms, and greatly increase the nation's prosperity. It is clear that Iran has learned to play the role of a buffer state in a troubled area. Both the U.S. and the Soviet Union recognize the benefit they could receive from a strong and independent Iran. Prospects for the future are discussed. 57 pp. Refs. (KB)

RM-5971-FF Prospects for Desalted Water Costs. W. E. Hoehn, Jr. August 1969.

An evaluation of methods for estimating desalted water costs and an assessment of the potential impact of some proposals for large-scale desalting plants, particularly in the Middle East. The consequences of basing water cost calculations on several different assumptions are examined, considering both fossil- and nuclear-fueled plant alternatives. Cost estimates for proposed plants in Southern California and Israel are studied, and several proposals for massive desalting and industrial development are investigated in the light of their central features, internal consistency, and agreement with available information. It is found that the possibilities for producing low-cost desalted water from nuclear-fueled plants have been overrated. The only method having some promise of success in achieving useful water costs would appear to be to import natural gas, which is available in parts of the Middle East at near-zero cost at the well-heads. It is suggested that before large-scale desalting projects of any kind can be undertaken, smaller plants will have to be built to provide a source of realistic data from which to evaluate the larger complexes. 71 pp. (CC)

RM-5973-FF The Palestine Arab Refugee Problem. D. Peretz. July 1969.

A discussion examining economic and political aspects of the Palestine Arab refugee problem, with analysis of some of the proposals that have been offered for solution. Throughout the twenty years of attempted negotiations on Middle East problems, a vicious circle seems to revolve around Arab insistence that other problems cannot be managed unless the refugee fate is first resolved, and the Israeli determination that progress toward solution of the refugee problem cannot be made unless the Arab states accept the political realities of Israel's existence, Arab responsibility for the displaced

Palestinians, and initiation of attempts to resettle the refugees within the context of overall regional development. While there is hope of resolving the economic problems of the Arab countries over a long period of time-including the problem of displaced persons-there seems to be little possibility of dealing with the heart of the Palestine problem, the dilemma of irredentism. 83 pp. (KB)

RM-5975-FF Economic Development Problems of Israel, 1970-1980. M. Bruno. March 1970.

An analysis of Israel's potential for future economic growth without further external financial support. Distinctive elements in the history of the Israeli economy help explain her two decades of remarkable growth performance: growth and composition of the immigrant population, sources of investment finance, and the motivation of the people. Following the 1960-65 period of prosperity, however, the sustained, rapid growth came to an end. The current account payments deficit fell appreciably during the recession, but when the economy recovered and expanded rapidly following June 1967, there was another upsurge in the payments deficit. The fundamental reason for much of the renewed deficit is analyzed as a structural weakness in the Israeli economy, which creates a major dilemma in the tradeoff between rapid growth and reduction of the balance-of-payments deficit. A summary of national accounts projections through 1980 is included. 97 pp. (KB)

RM-5979-FF Current Trends in Arab Intellectual Thought. A. Daher. December 1969.

A discussion of several recent trends in Arab intellectual thought with respect to Arab nationalism, Arab socialism, and the place of Islam in both. This Memorandum describes important questions and debates in Arab thought in the 1960s. Several solutions to the problem of reconciling Islam and Arab nationalism are offered, ranging from the argument that the two are fully compatible to the contention that they are in conflict. Younger Arab intellectuals have tended to neglect these arguments and the related concern for the past by turning to issues posed by modernization. The new intellectuals appear to be passing through a period of crisis in their own thinking that is characterized by secularism and radical self-criticism. Discussion remains at a high level of abstraction, however, and there is little sign that a more empirical, problem-solving approach is emerging. 40 pp. (KB)

RM-5996-PR Another Type of Risk Aversion. E. B. Keeler, R. Zeckhauser. May 1969.

A formulation incorporating the concept of 'size-of-risk' aversion into the process of selecting a utility function. This concept extends and complements Pratt's normative observation of risk aversion, namely, that as wealth increases, many decisionmakers would feel that they ought to pay less insurance against a given risk. However, as the size of potential loss increases, decisionmakers are more averse to risk and would be willing to pay a larger premium. They display what is known as (positive) size-of-risk aversion. In selecting a utility function, both concepts should be considered. 22 pp. Refs. (KB)

RM-6014-RC Models of Segregation. T. C. Schelling. May 1969.

Two theoretical models are developed to examine the individual incentives and perceptions of difference between people that can lead, collectively, to the segregation of various sub-populations. The models also clarify the extent to which inferences can be drawn from the phenomenon of collective segregation about the preferences of individuals, the strengths of those preferences, and the facilities for exercising them. The first of these two conceptual models is a simulation model that distributes individuals within an area in accordance with their preferences about the composition of the neighborhood. The variables are the ratio of the two races in the population, the demands for neighbors like oneself, and the size of the neighborhood within which an individual's preferences operate. The second model, which is analytical, examines the questions: What distribution of color tolerances among the population may be compatible with dynamically stable mixtures? What effect will the initial conditions and the dynamics of movement have on the outcome? What kinds of numerical constraints might alter the results? Use of the formal model to examine the phenomenon of neighborhood tipping does not reveal any important discontinuity necessarily occurring at the commonly accepted tolerance value of 20 percent black. 89 pp. (MJP)

RM-6017 Rand Work on International Development: A Brief Overview. C. Woll, Jr. June 1969.

Description of Rand research in the field of political and economic development. Rand staff members in diverse disciplines have been active in development research for 12 years, concentrating on Colombia, Turkey, Laos, Thailand, Korea, and the Philippines. Primary objectives of the program are to apply systems analysis to the problems of LDCs and to relate new technology to LDC economic capabilities. Principal studies include: (1) planning and economic aid, where Rand developed a method to permit comparability of different kinds of aid; (2) political and socioeconomic change, which raised important questions about the effectiveness of land reform in curbing rebellion; (3) economic structure and growth, which suggested that technological transfer is more important to development than larger inputs of capital and labor; and (4) population growth, which indicated that financial incentives might be more effective than gadgetry and reproductive biology in family planning programs. Rand hopes to continue and expand this work, which has domestic as well as international payoffs. 20 pp. Refs. (CD)

RM-6043-PR Limiting Damage from Nuclear War. W. M. Brown. October 1969.

Based on the current concept that nuclear attack would occur only after an international crisis, thus providing from several days to several months of strategic warning, this study maintains that D/L systems can be designed that would reduce present estimates of about 100 million fatalities by 90 percent. Two extreme programs are considered: a 'cheap' program based on urban evacuation and improvised fallout shelters, and an 'expensive' program based on urban blast shelters and active defense. In the cheap program the major expenses would be deferred until needed; the major labor would be contributed by the people for their own survival. The annual cost would be \$200 million or less, and the principal peacetime output would be plans for emergency action and a small number of trained professionals to guide mobilization when needed. For the expensive program, a model is proposed that would greatly reduce population vulnerability. The main advantages of this program are not fewer fatalities but high confidence, low socioeconomic disturbance, and less dependence on amount of warning. The model shows, however, that passive defense is the essential component of any effective D/L system. 105 pp. Refs. (MW)

RM-6054 An Information System for the National Security Community. S. Brown, P. Y. Hammond, W. M. Jones, R. L. Patrick. August 1969.

This study outlines the general features of an automated system to handle information on national security for the U.S. government. The system is suggested as a possible means of facilitating communication and cooperation in the intricate organizational context of national security policymaking. Initial implementation calls for an automated storage and retrieval system, centered in the Executive Office, to permit national security policymakers to keep recommendations and supporting data at the President's fingertips. Full text copies of lengthy documents would be held in microfiche repositories near users. MT/STs would be supplied to aid the writing and editing of messages and documents for release; and certain operational statistics now unavailable would be automatically collected. A central computer would store abstracts and key words of documents and full texts and key words of messages for query and immediate printout. To be maximally useful, the system must complement existing formal and informal channels of communication, be adaptable to a variety of management styles, and be able to accommodate future growth and procedural change. 44 pp. (CD)

RM-6057/1 Improving Budgeting Procedures and Outpatient Operations in Nonprofit Hospitals. V. D. Taylor, J. P. Newhouse. January 1970.

An analysis of the budget of a nonprofit hospital and the costs and operations of its outpatient department. The problem addressed is: How can the hospital use the funds available to it to provide maximum benefit to the community? A methodology is developed to answer that question. The methodology shows what parts of the operation are inefficient, what parts should be expanded, what contracted, what the net cost of the teaching program is, and what an appropriate pricing policy is. A revised budget format focusing upon social benefit and social cost, rather than profit and

loss, is also presented. 57 pp. (Author)

RM-6072-PR System Acquisition Experience. R. L. Perry, D. J. DiSalvo, G. R. Hall, A. J. Harman, G. S. Levenson, G. K. Smith, J. P. Stucker. November 1969.

An analysis of 21 military acquisition programs to see how closely original estimates of cost and performance compare with actual outcomes, and whether there has been any improvement in estimating outcomes in the 1960s over the preceding decade. Quantitative findings are reported as ratios of actual results to initial estimates based on the Technical Development Plan. Cost growth seemed to be the result of adjustments of target goal. Estimates seemed to be somewhat less biased toward optimism in the 1960s, but it is uncertain whether this was due to improved estimating or to improved control of program fluctuations. Performance characteristics factor numbers had a biased distribution, with some better than expected outcomes but also with some sizable shortfalls. The research indicates the need for continuing efforts to control the cost, schedule, and article performance outcomes of programs and for better understanding of the causes for program growth. 52 pp. (MT)

RM-6074-PR/ISA Chinese Industrial Growth: Recent Developments and Potential Growth Rate. F. M. Cone. December 1969.

An examination of developments that occurred during the industrial crisis that followed China's Great Leap Forward of 1958-1960, the recovery that followed, and China's prospects for industrial growth over the next decade. This work develops an estimate of the maximum level of industrial output from the scanty and often conflicting evidence for '65, projects an estimate for the period 1965-1980, and from this deduces a feasible volume of resources that could be considered available for additions to the Communist Chinese stocks of military hardware. China's future total output of machinery and equipment is measured in terms of two alternative assumptions, and hypothetical increases in the output of military hardware are derived and converted into dollar terms. If these assessments are approximately correct, then maximum feasible additions to military stocks over the years 1966-1980 might be somewhere between \$10 and \$14 billion, with allowance for the little known effects of the Cultural Revolution on the structure of industry. 91 pp. (See also RM-5625, RM-5662, RM-5841.) (KB)

RM-6076-PR Wage Variation in Soviet Industry. J. G. Chapman. February 1970.

Since the early 1950s, the United States has been interested in the growth of the Soviet economy, particularly in its ability to support high levels of military expenditure. This study investigates one aspect of Soviet income distribution, the wage structure resulting from the first major post-war Soviet industrial reform. Begun in 1956, this reform led to a new wage system in industry by 1960. Its aims, largely met, were: achievement of a desired allocation of labor, better worker performance, and at the same time a more equitable distribution of income. Results moved the USSR closer to eliminating income inequality, but despite a more plentiful supply of skilled workers, the demands of advanced technology coupled with a continued need for efficiency will mean continued inequality in earnings for some time. The study includes a comparison of the Soviet interindustrial wage differential structure with that of the United States and discusses trends for the future. 170 pp. Bibliog. (TC)

RM-6077-ARPA The Chinese Communist Revolutionary Strategy and the Land Problem, 1921-1927. K. C. Yeh. April 1970.

The first part of a prospective 3-volume analysis of the doctrine and practice of land reform as a tactical measure, with emphasis on its relation to goals of the Chinese Communist Party, political and economic restraints in specific localities, and its effectiveness in enlisting peasant support. From 1921 to 1927, largely as a result of the collapse of the Comintern CCP-KMT coalition policy, the CCP shifted attention from the urban proletariat to the peasant as its principal ally, from revolution from above to revolution from below. And by 1928 radical agrarian reform, at least in Mao's view, became the crucial factor on which a successful revolution would depend. His strategy: confiscate public and private land, redistribute it to the poor and landless peasant, and the peasant would fight a protracted war to protect it. 116 pp. Ref. (TC)

RM-6108-1-RC A Normative Model of Medical Research Resource Allocation. E. B. Keeler, J. P. Newhouse. June 1970.

This memorandum is concerned with the allocation of resources to biomedical research. In particular, it asks the question: How much should the country spend on such research? A simple mathematical model of individuals' preferences is proposed that gives reasonable predictions to qualitative questions posed. In lieu of obtaining sample data about consumer preferences, the model is used to determine what biomedical research is worth to consumers. The answer is that the probability of achieving future advances appears to be sufficiently low to warrant the conjecture that the nation is already spending more for biomedical research than it is worth to consumers. This revision expands the original by explicitly treating uncertainty rather than assuming it away. In addition, the first version assumed, incorrectly, that the important parameter α could not be greater than one. This revision corrects that assumption. Certain other less important errors also have been corrected. 23 pp. (Author)

RM-6115-PR The Delphi Method, III: Use of Self-Ratings To Improve Group Estimates. N. C. Dalkey, B. Brown, S. W. Cochran. November 1969.

An analysis of the validity of using self-ratings as a technique for selecting more accurate subgroups in applications of the Delphi procedures for eliciting group judgments. A series of experiments was conducted using 16 groups of upper-class and graduate college students answering almanac-type questions (20 subjects per group and 20 questions per subject). The findings indicate that if the difference in average self-rating between the subgroups is substantial, and if the subgroups are held to reasonable size, both the degree of improvement and the total number of improvements are greater than when feedback alone is used. This study augments the results reported in RM-5888 and RM-5957. 30 pp. Refs. (MT)

RM-6118-PR The Delphi Method, IV: Effect of Percentile Feedback and FeedIn of Relevant Facts. N. C. Dalkey, B. Brown, S. W. Cochran. March 1970

An investigation of the effect on group accuracy of two variations in the Delphi procedures. In these exercises, 20 general information questions are answered by 2 groups of respondents, who, after receiving some form of feedback, may revise their answers. In the first variation, feeding back individual percentiles resulted in no improvement over feeding back the median and quartiles of the group response. On the other hand, in the second variation, adding a relevant fact to the median and quartiles information resulted in a statistically significant increase in numerical accuracy. The number of changed answers was also greater, suggesting that introduction of a relevant fact strengthens motivation for revision. For a number of military concerns, such as long-range technological development assessment or future threat evaluation, the expertise of a group of decisionmakers is relied on. The Delphi studies are an effort to improve such judgments through refined procedures. 46 pp. Ref. (MT)

RM-6121-PR Defense Budgeting: Organizational Adaptation to External Constraints. J. P. Crecone. March 1970.

A detailed review of the annual Department of Defense budgetary process. In spite of many differences in necessary procedures under PPBS, adopted by DOD in 1961, methods of arriving at dollar figures for line items in the appropriations request are not dissimilar to those of the 1950s--namely, a prior determination of the total for defense and a cutting of service requests to meet an overall target figure. Actual military programs are rarely considered on their merits alone (as PPBS proponents intended they should be), but must be 'brought into line' at the end of the budget cycle. The problem: Planning and programming decisions do not carry the force of actual resource allocation decisions in DOD; and, while PPBS is well designed for program planning, it fails as a system to take into account important fiscal constraints on the defense budget, the capacity for which should be built into the system to make it credible to the services. 72 pp. (TC)

RM-6133-OEO An Analysis of Poverty: Some Preliminary Findings. J. J. McCall. December 1969.

Statistics on race, age, sex, and estimated annual income up to \$4500 for

836,000 Americans in the period 1962-1965 were processed using a probabilistic model to determine patterns of income mobility. Results showed that during this period of sustained economic growth non-white males close to the poverty line (most of whom were blacks) benefited more from expanded job opportunity than their white counterparts. However, another large number of blacks, the hard-core poor, remained mired in poverty. Findings suggest that while upward mobility may well be linked to a rise in the GNP, and while mature black male workers are more sensitive to the business cycle than many of their white counterparts, there are certain groups in society that remain unaffected by economic growth. 53 pp. Refs. (See also RM-5739OEO.) (TC)

RM-6149-AID The Philippine Family Planning Program: Some Suggestions for Dealing with Uncertainties. J. E. Koehler. February 1970.

Some tentative conclusions about family planning in the Philippines. Using data from National Demographic Survey (NDS), the study investigated knowledge and use of birth control procedures among Philippine women by language, income, age, rate of use, information source, and use or nonuse. The study offers the following suggestions to designers of the AID family planning program in the Philippines: (1) to avoid explicit reference to some population growth rate as a formal program goal; (2) to examine the complex relationship between knowledge and use of contraceptive techniques; (3) to gather information from across the country rather than in depth from any single area or ethnic group; and (4) to use its leverage over the various agencies concerned to record experiences of individual women and to standardize recordkeeping. 36 pp. (SM)

RM-6162-OEO Racial Discrimination in the Job Market: The Role of Information and Search. J. J. McCall. January 1970.

A theory of the value of discrimination in the job market as a function of the business cycle, based on elementary models of economic behavior in which, among other things, employer uncertainty about employee capacity to produce is incorporated. A favorable economic environment is assumed to induce employers to engage in hiring experiments, which, if they prove favorable, may eliminate race as a screening device when labor markets become less tight. If valid, the hypothesis implies that discrimination by employers--and by the non-white poor in their job search--is explicable on purely economic grounds and that a tight labor market could cause both groups to alter beliefs that give rise to discriminatory practices. 37 pp. Ref. (TC)

RM-6169 The Record of Soviet Economic Growth. N. M. Kaplan. November 1969.

A detailed analysis of measures of Soviet economic growth, with many alternative calculation methods. Six indexes of national product are synthesized from economic sector indexes (using 1937 and 1955 weightings for 3 different formulations). Results are compared with those from other sources. The indexes show that the USSR growth rate declined markedly throughout all segments of the economy, except services, within 1950-1965. Except perhaps in agriculture, the decline appears to be according to plan. During those years the growth rates for national product, national product per capita, and agriculture were essentially the same as U.S. rates for 1962-1965. Otherwise, Soviet economic growth rates for the years 1928-1940 and 1950-1965 are substantially higher than U.S. rates. The postwar increase in per capita consumption greatly exceeds the U.S. rate, but the level of consumption is less than half of the U.S. level. For the United States, national product and per capita consumption increase at the same rate. 245 pp. Ref. (See also RM-6170.) (MW)

RM-6170 Earnings Distributions in the USSR. N. M. Kaplan. November 1969.

An analysis of the extent of differentials in average earnings in different sectors of the Soviet economy, branches of industry, and occupational groups. This has always been one of the least-known aspects of the post-war Soviet economy, but a new Soviet statistical handbook gives the distributions of average monthly earnings and of annual employment, making possible this analysis of the trends in inequality over time. The claim of a 'Soviet income revolution' seems to be accurate. Since 1950 earnings differentials have been reduced substantially and to the point where the inequality is now

the same as in the U.S. However, the actual amount of the average differential in rubles and in purchasing power has been increasing while the percentage decreases. The Soviet distributions are also much less symmetrical than similar distributions in the United States. 193 pp. Ref. (See also RM-6169.) (MW)

RM-6178-PR PPBS, Suboptimization, and Decentralization. A. Smith. April 1970.

A theoretical discussion of suboptimization and decentralization to consider the appropriateness of various financial controls, constraints, and incentives. For suboptimization to be useful as an aid to decisionmaking in centralized organizations, marginal rates of substitution among the factors involved must be independent of the value of factors outside the area of suboptimization. A decentralized system would appear to meet these conditions, but there are additional problems--in every case the central authority must devise a system of controls that will hold conflicts between upper and lower levels in the organization within tolerable limits. The analysis is applied to various alternative forms of organization in the Department of Defense: decentralization by services, by service and program, and by services with some reallocation of functions; decentralization by theater, full unification, and decentralization by strengthening the central controls of the present system. 37 pp. (KB)

RM-6199-FF The Future of Cable Television: Some Problems of Federal Regulation. I. L. Johnson. January 1970.

The first of a series of studies of cable TV and the public interest under Ford Foundation sponsorship. Contrary to present FCC policy, the study concludes that the public interest is best served by allowing cable TV to grow freely under liberal rules, picking up distant broadcast signals without restriction except for payment (which is not now made). By paying for retransmission rights and by originating programs that are also available for retransmission, cable TV would share in the costs of broadcasting, thus making up for any loss of broadcasting revenue from advertisers. If cable TV should later become a real competitive threat to over-the-air TV, protective regulations should be tailored to the needs of the most vulnerable stations rather than serving, as now, to protect the profit levels of the strong VHF stations in the largest cities. The aim is to strengthen the weak stations rather than to eliminate the competition that offers promise of a far richer TV menu; a promising method is to require nondiscriminatory access to all programs for all stations. 100 pp. Ref. (MW)

RM-6206-PR German Air Attacks Against Industry and Railroads in Russia, 1941-1945. O. Hoeffding. March 1970.

A chronicle of the failure of German air force efforts to mount a strategic bombing offensive against industrial targets in the USSR. The study contends that what had been neglected in prewar planning could not be supplied by intrawar crash programs and improvisation--a topical lesson now that the doctrine of massive retaliation has given way to the notion that conventional air war may be with us in some form in the future. Luftwaffe doctrine was flexible enough to accommodate a strategic role for the German air force, but prewar disinterest and a wartime emphasis on tactical support of ground forces crippled the build-up of a strategic capability until it became a case of too little too late. Qualitative deficiencies coupled with numerical deficiencies in planes, delays in choosing a target and finally diversion of the 'strategic' remnant to rail strikes, 'the wrong target at the wrong time,' spelled failure for the Luftwaffe. 73 pp. (TC)

RM-6239-PR A Note on Tactical vs. Strategic Air Interdiction. E. Dews. April 1970.

Battle relevance rather than battlefield proximity should be the useful criterion in distinguishing between tactical and strategic interdiction. Tactical interdiction has to do with target systems having payoffs directly and immediately related to the success of friendly ground forces, whereas strategic interdiction has to do with target systems having payoffs that are only indirectly and in the long term related to ground force success. This distinction is contrasted with the close-versus-deep dichotomy and seems a more sensible way of looking at target systems. What is important is the probable effect of an air strike, not its distance from the battlefield. For tactical interdiction, payoffs are extremely sensitive to the nature of the war, to the character of the battlefield, and to what is happening on the ground, cur-

rently and in the near future. Strike effectiveness depends not only on what is done to the target, but on when this is done. 17 pp. (RG)

RM-6309-FF Cable Television: The Problem of Local Monopoly. R. A. Posner. May 1970.

This study probes advantages and disadvantages of alternative forms of local cable television regulation. With the scramble among cable operators for municipal franchises growing, so is concern about local monopoly--the potential for abridging the public interest through excessively high subscriber fees and direct channeling of huge profits into the hands of cable companies who successfully compete for the right to 'wire up' individual communities. Among variants of the franchise approach discussed: city governments could require reasonable subscription fees, place a ceiling on profits, or require a suitable array of services. The author urges a period of experimentation with a variety of the options available for both preventing monopoly prices and capturing monopoly profits for the public--and, because of current uncertainty over future CATV characteristics, for examining the actual extent of the monopoly problem. 42 pp. (TC)

Papers

P-2593 The Use of Computers in the Processing and Analysis of Geographic Information. R. C. Kao. December 1963.

An assessment of the impact of high-speed computers on the collection and use of data in geographic research. The following are discussed: (1) the way in which the impact is felt, (2) geographic problems likely to arise with the increasingly widespread use of high-speed computers, (3) adoption of a universal mapping system, and (4) problems facing users of geographic data. 28 pp.

P-2594-2 Nuclear Strategic Options and European Force Participation. M. W. Hoag. July 1963.

A discussion of nuclear power policy in NATO. It covers the re: its implicit in shared nuclear control, in multilateral direction, and in separate national forces. The complexities of the situation are shown by examples. 52 pp.

P-2641 Suburbanization of Employment and Population, 1948-1975. J. H. Niedercorn, J. F. Kain. January 1963.

An analysis of the postwar redistribution of employment and population within 39 of the largest U.S. metropolitan areas. Rapid growth has occurred in the metropolitan ring and only slow growth in the central city. An econometric model indicates that these trends are likely to continue in the future. The significance of these findings for urban development and transportation planning is discussed. 39 pp.

P-2649 Some Aspects of the 'Value' of Less-Developed Countries to the United States. C. Wolf, Jr. October 1962.

A study of the value of less-developed countries to the United States. Their value is also considered in certain extreme contingencies over a period that is short-term in a historical sense, though somewhat longer from the standpoint of economics. Several distinctions are made: (1) between the direct and indirect value of a country to the United States, (2) between the value to the United States and the value to the Soviet Union or to Communist China, (3) between the value of a particular country in connection with local wars and its value in various central war contingencies, and (4) between the values that can be quantified and those which can only be qualified. In these terms, the author discusses the military, economic, political, psychological, and ideological aspects of the value of less-developed countries to the United States. 20 pp.

P-2688 Research on Communist China's Foreign Trade: Comments on Three Papers by Shun-Hsin, Robert F. Demberber, and Feng-hwa Mah. O. Hoeffding. January 1963.

A discussion of the difficulties of evaluating Communist China's foreign trade because of the unavailability of even reasonably accurate data. This lack of basic information reduces the value of the conclusions reached by the authors of the three papers. 18 pp.

P-2702 Aggregation and Multiplicative Production Functions. B. F. Massell. February 1963.

A comparison of aggregation and multiplicative production functions in

Industrial studies. 7 pp.

P-2705 Vagueness and Decision: A Rejoinder. D. Ellsberg. February 1963.

A rejoinder to Professor Roberts' denial that vagueness of opinion plays an important role in violations of the Savage axioms. It is pointed out that Roberts' own remarks would seem to indicate the importance of vagueness. 10 pp.

P-2710 A Note on Some Noxious Alternatives. A. R. Ferguson. February 1963.

A discussion of the probability of occurrence of events that might lead to central war and their probable aftermath. The importance of these various alternatives in decisionmaking is covered. 4 pp.

P-2713-1 A Note on Lagrange Multipliers. R. C. Kao. July 1963.

A clarification of the meaning of Lagrange multipliers and a natural reformulation of the equilibrium conditions which permit a better insight into the nature of constrained extremum problems in economics. 12 pp.

P-2717 Some Suggested Changes in Research and Development Strategy and Their Implications for Contracting. T. K. Glennan, Jr. March 1963.

Suggestions for possible changes in the R&D process, based on a number of case studies of AF development projects. Special attention is given to advanced experimental hardware or prototype developments. The author defines these and suggests certain shifts in emphasis, with their advantages. The necessary changes in military contracting procedures to incorporate them are covered. 14 pp.

P-2723 Is the USSR Superior to the West as a Market for Primary Products? E. Neuberger. March 1963.

An evaluation of Soviet claims that the Communist countries, by virtue of their central planning and rapid growth, represent much more attractive markets for primary-product exports from underdeveloped countries than do the allegedly stagnant and unstable economies of the West. It is found that the Soviet market not only falls short of such perfections, but is, compared to Western markets, neither large nor particularly stable. Soviet claims of rapid growth in primary-product imports are, however, fully confirmed by the data. This Paper is a summary of RM-3341-PR. It extends the period covered by the Memorandum by including data for 1961 in the calculations. 15 pp.

P-2732 Some Applications of Operations Research to Problems of Developing Countries. C. Wolf, Jr. April 1963.

A review of the valid uses of operations research in the management of economic and military-economic problems of underdeveloped countries. Certain qualifications and reservations are pointed out, these reservations tending to become more serious the higher the level of optimization of the particular problem. Despite these limitations, however, it seems clear that quantitative analytical techniques can make important contributions to improved decisionmaking by improving the level of discussion preceding the decisions, by clarifying the available choices, by focusing attention on the implicit values of a particular choice. 32 pp.

P-2733 Nuclear Control After Nassau. M. W. Hoag. April 1963.

A consideration of American nuclear policy toward a possible NATO nuclear force since the Nassau meeting in December 1962. Among the changing emphases may be a greater voice for all member nations, a decreasing need for nuclear initiatives, and new evidence of longer-run commitment to collective defense in and beyond the multilateral force. These developments would combine to relieve anxieties and lessen status distinctions in the alliance. 22 pp. (See also P-2594-1.)

P-2734 Models for Economic Development. F. T. Moore. July 1963.

A Paper on the formulation and use of models for economic development and growth. Characteristics from which model builders make a choice are discussed, and a selected set of models proposed by various authors is examined. Included are models by Chenery and Clark, Moore and Sandee, Markowitz and Manne, Lange, Johansen, Stone, and the PARM (Program Analysis for Resource Management) model being developed by the National

Planning Association. 44 pp.

P-2743 The Nuclear Europe Myth. M. W. Hoag. May 1963.

A discussion of the complexities involved in the provision of nuclear aid to a NATO multilateral force, to selected nations, or to a European community. All of our allies naturally wish a voice in nuclear councils; all or none may wish access to the trigger or safety catch. Until a workable solution to this situation is reached, we can only consider aid to France and Great Britain on its own merits rather than as aid to a nonexistent European Defense Community. 13 pp.

P-2753-1 Joint Cost and Price Discrimination: The Problem of Communications Satellites. L. L. Johnson. July 1963.

An examination of the potential conflict over the pricing of communications satellites. Following a brief description of satellite technology and institutional arrangements for developing and operating a commercial system, the cost structure is analyzed from data on past satellite studies. In light of the analysis a theoretical peak-load pricing model is employed to discuss efficient pricing for satellites. Finally, it is demonstrated that the enterprise is likely to face serious dilemmas concerning its pricing policies because of the various objectives set forth in the Communications Satellite Act. 30 pp.

P-2755 Transport Technology and the 'Real World.' H. Heymann, Jr. June 1963.

A discussion of transport planning and technology. The Paper points out that transportation systems should respond to human needs and should not become a costly end in themselves. Thought must be given to the impact of such systems on the quality and character of community and national life and on the locational pattern of economic activity. 13 pp.

P-2771 Signals, Ambiguity, and Strategic Force Structure. H. Averch, S. Wildhorn. July 1963.

A consideration of problems arising from an attempt to implement a strategy of stable deterrence over time. The analysis is confined to a bi-polar world where nation A is an open society and B is a closed society. The time horizon is limited to the next ten years. It appears that even small improvements in the content and timing of intelligence information received by A would tend to constrain B and open new channels of communication. 21 pp.

P-2773-1 The Case of a Pure Public Good: Television Broadcasting. J. R. Minasian. September 1963.

A discussion of the economics of commercial and subscription television. It is pointed out that both kinds of broadcasting could be used, rather than one kind exclusively. 17 pp.

P-2787 The Effect of Research and Development on the Economy. R. R. Nelson. September 1963.

A summary of the more important ways that science and technology affect the economic system. It is pointed out that the present manner of calculating the Gross National Product cannot possibly reflect all the effects of technological change, and that we have only begun to understand the process of economic change in a quantitative way. 11 pp.

P-2788 A Case Study in the Economics of Information and Coordination: The Weather Forecasting System. R. R. Nelson, S. G. Winter, Jr. September 1963.

An application of the economics of information and coordination to problems involving the dissemination, use, and evaluation of weather information. The case studied is the decision problem that confronts the dispatcher of a fleet of trucks. It is concluded that the public forecaster's choice of an information structure should reflect the importance of the different weather dimensions as determined by the number and types of decision problems faced and the sensitivity of the payoff to the action taken. 34 pp.

P-2797 Fortress America: A Reply. M. W. Hoag. September 1963.

A discussion of Ronald Steel's thesis in 'Fortress America' (Commentary, August 1963). The Paper contends that Mr. Steel has greatly misinterpreted the American design by oversimplification, and presents a number of reasons for that contention. 9 pp.

P-2018 Divergences Between Individual and Total Costs Within Government. R. N. McKean. November 1963.

A study of the contrast between attitudes toward the private and public portions of the economy, namely, the difference between costs and rewards as perceived by decisionmakers, and total costs and rewards produced by their actions. These differences are often called external economies or diseconomies or spillover effects, they sometimes affect people in ways that decisionmakers do not take into account. The effect of the function of these differences in government operations is presented. 9 pp.

P-2019 An Economist Looks at R&D Management. T. K. Glennan, Jr. November 1963.

A broad discussion of the allocation of funds between applied research and systems development. Uncertainty about which weapons will achieve deterrence and how we can best develop the weapons we choose complicates R&D decisions. The author advances certain tentative reasons for spending a greater proportion of money in applied research, such as the fact that it provides a larger menu of components and that systems development based upon intensive applied research leads to systems of higher quality. 9 pp.

P-2020 A Note on Pesek's Method for Measuring the Rate of Economic Growth. R. T. Nichols. November 1963.

An examination of Pesek's method for measuring the rate of economic growth. It is concluded that it must be defended on grounds other than those suggested in Pesek's paper, and a solution is offered consistent with and as defensible as Pesek's. 3 pp.

P-2025 Technological Advance, Economic Growth, and Public Policy. R. R. Nelson. December 1963.

This Paper (1) examines the role of technological change in the process of economic growth to provide a perspective on the benefits and costs involved; (2) discusses some of the problems and opportunities of public policy with special emphasis on research and development. 19 pp.

P-2036 The Objectives of Transportation in Economic Development. H. Heymann, Jr. December 1963.

Outlines the needs and objectives for transportation systems and national transportation policies. Discusses the limitations and proper role for economic analyses in determining goals and optimal uses of transportation. Also examines transportation planning in the U.S. and the USSR in light of economic development. (Based on a lecture delivered to the Harvard Transportation and Economic Development Seminar, February 1963.) 18 pp.

P-2049 The Impact of Arms Reduction on Research and Development. R. R. Nelson. January 1964.

An attempt to explore the effects of arms reduction on research and development and implications for public policy. The spending of the Department of Defense and the Atomic Energy Commission in defense programs is used as the measure of defense-related R&D. The key to the problem probably lies more in effective fiscal and monetary policy than in anything else. If handled wisely, the freezing of R&D resources could be one of the most important economic benefits of disarmament. 18 pp.

P-2050 The Role of Project Histories in the Study of R&D. T. A. Marschak. January 1964.

This Paper illustrates the possibilities as well as the limitations of the project-history approach for testing conjectures about the nature of development. A number of histories are presented in each of several areas of military technology. The histories describe, with varying thoroughness, (1) the major uncertainties in the project's successive stages, (2) the commitments made at each stage, and (3) the size of the project's total effort and the technical advance achieved by the developed item. 126 pp.

P-2080 A Note on the Soviet Minimum Wage. J. G. Chapman. March 1964.

A definition of what minimum wage means in the Soviet Union and its relationship to the program of wage reform. Minimum wage is tied to production and its establishment depends on the priority of the worker's employment. Workers in material production benefit first. Establishment of the minimum wage in the nonproductive sphere has been postponed. 9 pp.

P-2087 Incentives and R&D Contracting. T. K. Glennan, Jr. March 1964.

An examination of the kinds of pressures and motivations which surround the three major participants in the R&D contracting process: the engineer in the government laboratory, the contractor, and the procurement office. It is held that too much importance is attached to the short-run profit-making motivations of a contractor as a source of incentive for efficient conduct of R&D activities. 14 pp.

P-2098 Trends in Consumption in the Soviet Union. J. G. Chapman. March 1964.

An outline of the changing trends in consumption in the USSR from 1928 to 1958. It is shown how the shift in the Russian economy from agricultural to industrial has had its effect on these trends. The growth of consumption in food, clothing, household goods, and shelter, and the importance of such government supplied items as medical care and education are illustrated. 10 pp.

P-2099 Foreign Aid--Is It Worth Continuing? E. Neuberger. April 1964.

A discussion of the value of U.S. foreign aid and of reasons for and against its extension. If the true costs of granting the aid are compared with the costs of not granting it, the investment will look much more desirable than it does under the usual approach, of trying to prove that certain positive benefits to the U.S. national interest are assured by granting it. 11 pp.

P-2091 Continuous and Discontinuous Rates of Change. R. T. Nichols. March 1964.

An argument that techniques of manipulation developed to handle discontinuous rates of change are not readily applicable to phenomena that exhibit continuous rates of change. The argument is demonstrated in growth (or decay) rates, financial transactions and natural phenomena, and continuous formulae for cost and benefit comparisons. 17 pp.

P-2093 The Growth of Soviet Consumption Since 1958: Comments on I. Erro's 'And What of the Consumer?'. A. S. Becker. March 1964.

A discussion of the pace and pattern of growth in Soviet consumption since 1958. The author argues that the Soviets were dazzled with the success of the Seven Year Plan, Sputnik, and the 1956 and 1958 crops. Recently agricultural stagnation and high capital-output ratios caused them to qualify their expectations. Unlike Erro, however, he does not see a significant downturn from the 1959-1962 pace. 7 pp.

P-2097 Savings Regressions, 'Self-Help' and Development Performance. C. Wolf, Jr. July 1964.

Presentation of a method for assessing performance in a developing country based on self-help measures in government and in domestic private savings. The method consists of deriving standards or norms for individual countries from multiple regression models that express an indicator of performance (in this case, savings) as a function of several indicators of socio-economic structure. 27 pp.

P-2093 Science, the Economy, and Public Policy. R. R. Nelson. April 1964.

A summary of a few of the more important things that economists know about the way science and technology affect the performance of the economic system. Its author suggests what might be the proper objectives for public policy, and tries to identify a few of the major problems which that policy must overcome. The analysis and interpretation is of the American economy but should have wider application. 21 pp.

P-2112 Trade with Communist Countries--Yes or No? E. Neuberger. May 1964.

A discussion of three possible national policies on trading with Communist countries: the traditional free-trade position, which holds that political or other noncommercial considerations should be kept to a minimum; a policy of complete trade denial, which attempts, on moral or strategic grounds, to deprive an enemy of all trade opportunities that might increase his economic strength; and a policy of selective trading, which assumes that free trade in certain goods might help to make an enemy less aggressive internationally or less oppressive at home. The author argues that these alternatives over-

simplify the problem, because none is completely valid in all circumstances, and he raises a number of specific questions that might better be asked in deciding whether to use trade policy for noneconomic purposes. He offers answers in the case of trade with the USSR and Cuba. 15 pp.

P-2919-2 Toward a General Theory of Customs Unions for Developing Countries. C. A. Cooper, B. F. Massell. May 1965.

An analysis of the factors involved in formulating a general theory of customs unions for developing countries. The model (1) accepts industrialization as a legitimate policy goal for the less-developed countries; (2) regards tariff as a policy instrument rather than an exogenous variable; and (3) considers how membership in a customs union may enable a less-developed country to achieve more economically the ends served by protection. 27 pp.

P-2923 U.S. Business Interests in Cuba and the Rise of Castro. L. L. Johnson. June 1964.

An exploration of the role that the large volume of U.S. investment in Cuba may have played in helping to shape political relations between the U.S. and Cuba during Fidel Castro's early years in power. 26 pp.

P-2926 Economics of Defense. R. N. McKean. July 1964.

An examination of the economic aspects of defense planning. The author discusses resource management, program budgeting, cost-benefit analyses, and institutional arrangements. 26 pp. Bibliog.

P-2927 The Usefulness of Aerospace Management Techniques in Other Sectors of the Economy. T. K. Giennan, Jr. June 1964.

A discussion of aerospace management techniques and the possible transference of these techniques to the non-aerospace industry. Two problems are considered in the utilization of management techniques developed in the space and defense programs: (1) by companies oriented toward the civilian market; and (2) by present government contractors in the non-government market place. 8 pp.

P-2940 Rationalizing NATO Strategy. M. W. Hoag. July 1964.

A discussion of various aspects of NATO strategy based on three recent books on the subject: A. Buchan and P. Windsor's *Arms and Stability*; R. Steel's *The End of Alliance*; and R. Strauss-Hupe, J. E. Dougherty and W. R. Kintner's *Building the Atlantic World*. In the light of these works, the Paper examines various issues and problems in the design and function of NATO. 27 pp.

P-2942 The CES Production Function and Economic Growth Projections. R. R. Nelson. July 1964.

Presentation of a way to approximate the CES (Constant Elasticity of Substitution) model by the simpler Cobb-Douglas model plus an added term. The Paper examines the extra power of the CES model over the unitary elasticity of substitution (Cobb-Douglas) in explaining past growth of the American economy. The analysis suggests that gains in terms of explaining or predicting growth of output by use of the more complex model are not very great in an economy like that of the U.S. In an economy where capital stock is growing extremely rapidly, however, there may be significant gains. 11 pp.

P-2944 Innovation and Market Structure. O. E. Williamson. July 1964.

An analysis of factors influencing the relative proportion of innovations introduced by the largest firms in an industry. The study focuses on the effect of monopoly power on the relative contributions of these large firms. 18 pp.

P-2948 Growth and Trade: Some Hypotheses About Long-Term Trends. R. N. Cooper. July 1964.

A review of some of the results of recent theoretical work on the relationship between economic growth and foreign trade. It attempts to show how U.S. foreign trade might have developed on the basis of widely established views concerning changes in factor proportions and the nature of technological change. In conclusion, the author offers some suggestions to explain the vigorous growth of trade despite the apparently persuasive reasons it should languish. 32 pp.

P-2961 A Tale of Probable Regions (A Statistical Allegory). R. Zeckhauser. August 1964.

A critical allegory of statistical methods involving probable regions. 5 pp.

P-2966 The Distribution of Gains in a Common Market: The East African Case. D. F. Massell. August 1964.

An examination of the distribution of economic gains within the common market formed by Kenya, Uganda, and Tanganyika. Discussed are the effects of market forces on investment activities and new industry, and governmental redistributive measures. 25 pp.

P-2968 The Uses and Limitations of Nuclear Deterrence in Asia. C. Wolf, Jr. August 1964.

An examination of attitudes current in 1964 toward the subject of nuclear deterrence in Asia. The Paper discusses several possible developments which might affect the efficacy of these viewpoints, and considers some measures for surmounting the limitations of deterrence. 17 pp.

P-2963 Inside Bureaucracy. A. Downs. August 1964.

A theoretical study of bureaucratic decisionmaking. It attempts to provide both a better understanding of the operation of bureaus and to supply the techniques for predicting their behavior. 29 pp.

P-2972-2 A New Look at Customs Union Theory. C. A. Cooper, B. F. Massell. April 1965.

An analysis of the economic welfare implications of customs unions within the context of (1) tariff reduction, and (2) pure trade diversion. 9 pp.

P-2975 On Collective Farms and Producer Co-operatives. E. D. Domar. June 1965.

An analysis of the essential structure of the Soviet kolkhoze (collective farm)-i.e., a producer cooperative which uses the labor of its members, purchases other inputs, sells its outputs, pays a rent and/or taxes, and divides all or part of its net proceeds among its members. The Paper consists of: (1) a re-working, with a generalized production function, of B. Ward's model of a co-op (here called the 'Pure Model'); (2) a digression on the co-op as a monopoly; (3) presentation of the co-op model faced with a realistic supply schedule of labor; (4) summary and conclusions. 37 pp.

P-2980 Soviet Banks and Bankers. E. Neuberger. September 1964.

A description of the Soviet banking system and the role Soviet bankers play in the economy of their country. The paper considers the organization of the Soviet banking system, the Soviet equivalent of the U.S. commercial bank, the role of money in the economy, and such bank operations as deposits and short-term credits. 32 pp.

P-2991 Resume of the RAND Conference on Urban Economics. J. H. Niedercorn, A. H. Pascal. October 1964.

A resume of the Conference on Urban Economics held 24-25 August 1964 at RAND. This conclave of public officials and researchers discussed race relations and poverty, urban transportation, and ways in which a coordinated set of policy tools for attacking urban problems and improving urban functions might help in shaping a better metropolis. 32 pp.

P-3004 National Income and Welfare. A. Bergson. October 1964.

A discussion of the use of national income data in summarizing the impact on the welfare of a community of changes in the production and disposition of different commodities. 29 pp.

P-3012 Technical Progress in the Capital Goods and Consumer Goods Sectors of the United States. V. D. Taylor. November 1964.

Presentation of a method to fit two-sector growth models to actual data that can be used to study the empirical implications of the models. Included are estimates of the historical course of technical progress in the consumer and capital goods sectors of the United States during the period 1929-1955. 25 pp.

P-3017 The Value of Unchosen Alternatives. A. Downs. November 1964.

A discussion of a 'law' which the author sees inherent in a broad social principle; namely, that people value desirable alternatives even though they do not make use of them. The Paper discusses the implications of this law by analyzing why unused alternatives are valuable, and concludes with a list of applications of the principle in a variety of situations. 8 pp.

P-3031 A Theory of Bureaucracy. A. Downs. November 1964.

Presentation of a theory of bureaucratic decisionmaking based upon the hypothesis that bureaucratic officials are motivated by their own self-interests at least part of the time. The theory as developed has two major purposes: to permit a better understanding of the operations of bureaus, and to make possible more accurate predictions about their behavior. 13 pp.

P-3035-1 National Priorities and Development Strategies in Southeast Asia. C. Wolf, Jr. June 1965.

A discussion of the development strategies of Southeast Asian countries as reflected by the allocative pattern or emphasis that has characterized the development process during the 1955-1962 period. The three categories of allocation discussed are: (1) among sectors; (2) between public and private activities, and (3) to trade, more particularly to the growth of exports. 18 pp.

P-3050 Analysis and Defense in the Sixties. J. R. Schlesinger. January 1965.

A discussion of aspects of defense decisionmaking as a problem not necessarily solved by military cost analysis or economic analysis of allocation of military resources. The Paper is an expansion of the author's comments at a meeting of the Panel on Defense Economics of the American Economic Association, December 1964. 6 pp.

P-3072-3 Full Employment Policy and Economic Growth. R. R. Nelson. February 1966.

An investigation within the context of a simple aggregative model of how the rate of labor force growth and the rate of technical advance influence the fiscal and monetary policies needed to maintain equality of aggregate demand and potential output. The model integrates two strands of analysis: (1) neoclassical strand, from Solow's work on the determinants of growth of potential output; and (2) neoKeynesian strand, from the Harrod-Domar studies of the conditions under which full employment can be maintained in a growing economy. 25 pp. Bibliog.

P-3073 Agriculture Under Khrushchev: The Lean Years. Nancy Nimitz. March 1965.

A discussion of Soviet agricultural policy under Khrushchev, 1953-1963, particularly the reasons for the leveling off of farm output after 1958. Discussed are: (1) trends in inputs and incentives; (2) financial problems faced by farms as a result of the reorganization of the machine tractor stations in 1958; and (3) the central policy issue that emerged after 1958: whether differences in farm efficiency reflect differences in leadership or originate in natural conditions that demand economic, rather than administrative remedies. 31 pp.

P-3074 The Chinese Nuclear Explosion, N-Nation Nuclear Development and Civil Defense. E. R. Zilbert. April 1965.

A discussion of the implications for civil defense of nuclear proliferation. Civil defense activities of the past twenty years are reviewed and the present situation appraised. 26 pp.

P-3078 A Glance of the Chinese Language: Peking's Language Reforms and the Teaching of Chinese in the United States. F. Shieh. March 1965.

A discussion of the Chinese language including: (1) a brief history of its development; (2) a comparison of three major systems of romanization for written Chinese; and (3) the teaching of Chinese in the United States. Appendices include a comparative key to systems for romanization of Chinese, a table of simplified Chinese characters, index to Chinese phonetics, list of Chinese radicals and of the Old National Phonetic Symbols. 31 pp.

P-3082-1 Economic Growth and Poverty. R. R. Nelson. April 1965.

A discussion of economic growth as it relates to problems of poverty and their resolution. The factors promoting economic growth in the United States, adjustments required, and prospects for the future are covered. 12 pp.

P-3132-1 Insurgency and Counterinsurgency: New Myths and Old Realities. C. Wolf. 7 July 1965.

A discussion of the current doctrine that popular support is the key to successful insurgency and counterinsurgency movements. An alternative approach to the analysis of insurgency is presented. Its implications for U.S. attitudes toward the problem and for the design of operationally useful actions and programs in the counterinsurgency field are discussed. 25 pp.

P-3140 Pieties, Arms Policy, and the Scientist-Politician (A Review of Jerome Wiesner's 'Where Science and Politics Meet'). J. R. Schlesinger. June 1965.

A review of Wiesner's 'Where Science and Politics Meet,' a collection of essays and speeches presenting Wiesner's views on the scientist in political affairs. 10 pp.

P-3150 Soviet and Communist Chinese Industrialization Strategies. K. C. Yeh. May 1965.

A comparison of the Soviet and Communist Chinese strategies of industrialization during the period of their respective first two Five-Year Plans. The discussion is mainly limited to three broad problems of development policy: the allocation of resources to investment, the priority of industry in the allocation of capital investment, and the choice of techniques and scale in industrial production. While both countries began their first Five-Year Plans with the same goal and similar heavy industry strategy, China modified her plan before it came to a close and, since then, has experimented with alternative policies. 47 pp.

P-3153 Issues in the Choice of Development Policies. T. K. Glennan, Jr. October 1965.

A description of the development process and identification of the important elements of development decisions. A model of the process is created; it identifies the important determinants of cost and clarifies the issues facing a developer by providing a basis for describing alternative development policies or strategies. The author notes that the model does not provide the basis for choosing one policy because, he emphasizes, there is no one right policy for all development efforts. The Paper originated in empirical studies of the development policies adopted by the Air Force and other government agencies. 52 pp.

P-3154 The Antecedents of the X-1. R. L. Perry. June 1965.

A discussion of the antecedents of the X-1 from 1928, when a rocket plane designed by Lippisch was flown in West Germany, to such developments as the Me. 163 and the MX-324, with special concentration on the contributions of such people as Opel, Valier, Sanger, Goddard, and Walter. Also included are charts giving some of the important specifications of early rocket aircraft. 37 pp.

P-3158 A Concluding Note for *NATO Strategy and Economics*. M. W. Hoag. June 1965.

Remarks presented as a conclusion to a series of previously published Papers covering various aspects of NATO. They include arms, economics and alliance, doctrine and force postures, and strategic nuclear forces. This Paper comments on the relevance of these earlier views to present situations. 30 pp.

P-3160 Economic Recovery. J. Hirschleifer. August 1965.

A discussion of the possibilities of economic survival and recovery following a nuclear war. The author discusses available resources measured against the needs of the postattack society, and the successful use of them to meet those needs. He concludes that, though a postattack period of privation is to be expected, the historical record does not justify pessimism on the issue of ultimate recovery. 20 pp. (See also RM-3079-PR, RM-3436-PR.)

P-3183 Soviet Collectivization and China's 'Great Leap': Comments on Papers by A. Eckstein and K. C. Yeh. O. Hoefding. July 1965.

A discussion of possible reasons for the Soviet Union's hasty plunge into

total collectivization, an action contrary to Lenin's earlier stress on gradualism. The parallel case of China's Great Leap is briefly covered. 11 pp.

P-3197 An Analytic Model of Political Allegiance and Its Application to the Cuban Revolution. J. L. Enos. August 1965.

Development of a simple model whose successive solutions reveal changes in the political environment. The model is simple enough to be solved analytically, but complex enough to include the major factors underlying political change. It is applied to Cuba during the period of political upheaval that resulted in the overthrow of Batista's regime. 34 pp.

P-3205 Dilemmas in the Politico-Military Conduct of Escalating Crises. H. Averch, M. M. Lavin. August 1965.

A discussion of the difficulty in accomplishing political direction of the military in rapidly escalating nuclear crises. From the study of hypothetical crises by means of hand-played games, it is found that differences in responsibilities, perceptions, and operational styles between the political and military agencies result in inconsistencies between decisions and actions. It is also found that the political leaders are often deficient in adapting policies to the command-control constraints emerging during interactions with military sections. 12 pp.

P-3206 The Future of Input-Output in Soviet Planning: Comments on a Paper by Vladimir G. Tremli. A. S. Becker. August 1965.

A discussion, based on Tremli's analysis, of Soviet difficulty in applying input-output techniques to economic planning, and of the wider factors which inhibit mathematical economic planning in the Soviet Union. The main difficulty lies in a dichotomy between local execution and central purpose and the search for elusive goals, reflected in such immediate problems as the controversy over the starting point of plan models, the confusions surrounding the national cybernetics program, and the debate over how much enterprise autonomy will be allowed in the future. The author also discusses the pervasive influence of Party politics. 21 pp. Bibliog.

P-3218 Aggregative Production Functions and Economic Growth Policy. P. R. Nelson. October 1965.

A consideration of how the economists' knowledge of the relationship between various aggregative inputs and production possibilities can be of service to economic growth policies. Basing his discussion on possibilities open to the economy of the United States, the author assesses the strength and scope of existing economic knowledge and concludes that, while professional economists can provide useful direction for policy growth, their knowledge is more readily employed in identifying relevant uncertainties than in resolving them. 24 pp.

P-3240 Military Assistance Programs. C. Wolf, Jr. October 1965.

A review of the Military Aid Program (MAP), its origin, planning, and programming techniques. Analytical issues and research problems surrounding MAP as an instrument of U.S. foreign policy are discussed. 23 pp. Bibliog.

P-3251 Capital Formation in Communist China. K. C. Yeh. August 1966.

Trends in capital formation in Communist China, 1952-1959. Rate of investment, structure of investment by types of capital goods, and the pattern of allocation of fixed investment by major economic sectors are described. To provide a gauge for appraisal of the data, the results are compared with the corresponding estimates for China during the period 1931-1936 and with selected countries in the postwar period. Observations on investment and growth in the 1950's are included, and implications suggested by the statistical findings are discussed. 59 pp.

P-3253 Policies for Military Research and Development. T. K. Glennan, Jr. January 1966.

A general review of the structure, objectives, and history of the military R&D program. The author points out the many problems encountered in the program, particularly those stemming from a combination of technical uncertainties with resource requirements, and offers guidelines for restructuring military research organizations for increased efficiency. 37 pp. Bibliog.

P-3255 The Indian Economy and Defense. G. Rosen. October 1965.

Comments on current Indian economic planning and development prepared for *Capita* Magazine in Calcutta, India. The author notes that the recent fighting with Pakistan has drastically changed the environment of development planning. He suggests several ways India can maximize the beneficial effects of the increased defense expenditures and, at the same time, minimize the competitive effects upon the rest of the economy. 6 pp.

P-3266 Political and Economic Interrelationships in the Economic Development Process. G. Rosen. December 1965.

Presentation of a simple equilibrium model of the interrelationships of economic and political change. Because the author has found that political decisions determine the speed, priorities and methods of a country's economic policies, he has devised a set of concepts, which he believes will be useful in conducting research on the economics of developing countries. He stresses that an economist, who hopes to make suggestions that will be implemented, must be aware of the ideological climate of a country, the strength of various political groups, and the political, social and economic effects of the policies upon these groups. 14 pp.

P-3273 A Modest Proposal, or Technical Assistance in Reverse. G. Rosen. December 1965.

A proposal that the U.S. recruit foreign advisers from developing countries receiving U.S. aid in order to use their knowledge in the anti-poverty program. The author maintains that the experience of many foreigners engaged in regional or local development in their own countries would be useful in similar programs in the U.S., and also that such an exchange would contribute to improving relations with countries receiving U.S. aid. 7 pp.

P-3274 Cost/Benefit Analysis in Health. A. W. Marshall. December 1965.

Discussion of the economics of medical care and medical research. The author reviews the relevant research on the problem of cost benefit analyses in health (the focus is on the work of economists interested in the economic implications of improved health), and explores the likely requirements, difficulties, and opportunities for cost-effectiveness studies in government health programs. A sample program budget for health prepared by the Bureau of the Budget is included. 18 pp.

P-3280 Determinants of NATO Force Posture. A. W. Marshall. January 1966.

A discussion of the political and economic factors that continue to keep Western Europe militarily weak despite the spending of almost twenty billion a year on defense. The author sees the major determining factors in the diversion of resources to national rather than alliance use, in diseconomies of scale, in the high production cost of weapons, and in under-investment in new equipment. 20 pp.

P-3283 Project Versus Program Aid: From the Donor's Viewpoint. A. Carlin. June 1966.

An analysis of project versus program aid, a long-standing controversy in the administration of foreign aid. Although something can be said for both sides, the author stresses that the particular objectives of the donor, considering the particular circumstances of the recipient, should direct the final choice. 15 pp.

P-3284 Indian Transportation: A Sectoral Approach to Development Constraints. A. Carlin. April 1966.

Detailed analysis of the more important constraints on the transportation sector of the Indian economy. It shows how useful the sectoral approach can be in determining the obstacles to economic development in less developed countries, as opposed to saying the obstacles are a lack of technical competence, insufficient domestic savings, a balance-of-payment problem, political instability, and inadequate education and motivation. The rates and costs of Indian railroads, a monopoly directly administered by a ministry of the Indian government, and the government restrictions on Indian highway transportation, a sector that is largely dependent upon private production of motor vehicles, are evaluated. The author suggests that Indian transport policies could be coordinated by the operation of a competitive market force with railway rates reflecting costs (a solution not seriously discussed in India). 35 pp. Bibliog.

P-3286 The Efficient Achievement of Rapid Technological Progress--A Major New Problem in Public Finance. R. R. Nelson. December 1965.

An analysis of the R&D process focusing on programs designed to produce new products with significant performance advantages over existing ones. The R&D process is described qualitatively in terms of concepts and relationships. Characteristics of an efficient R&D policy which seem to be consistent with the qualitative description are presented. 14 pp.

P-3287 The Changing Environment for Systems Analysis. J. R. Schlesinger. December 1965.

Part of a study on defense management. The author discusses how changes in the environment influence systems analysis, describes the implications of increasing complexity in decisionmaking for the systems analyst, and urges greater ingenuity and flexibility in the design of systems. These themes are developed through: (1) descriptions of trends that have intensified demands on the analysts; (2) illustrations of general issues through two specific analytical and choice problems confronting defense analysts; and (3) predictions of the direction of future analytical work. 33 pp. Bibliog.

P-3290 Khrushchev Sans Reproche. Nancy Nimitz. January 1966.

A review of Sidney I. Ploss's book, 'Conflict and Decision-making in Soviet Russia. A Case Study of Agricultural Policy, 1953-1963,' Princeton University Press, 1965. The author of the review points out that Ploss is not interested in Soviet agriculture as such, but rather in the political process as exemplified by agricultural policy. 6 pp.

P-3295 Investment in Humans, Technological Diffusion and Economic Growth. R. R. Nelson, E. S. Phelps. January 1966.

Text of a paper delivered at the American Economic Association meetings in December 1965. The authors consider the importance of education for a particular function requiring great adaptation to change and propose two models suggested by these considerations. The models (of the process of technological diffusion and of the role of education) show that the rate of return to education is greater the more technologically progressive is the economy. 13 pp.

P-3302 Is the Marble Canyon Project Economically Justified? A. Carlin, W. E. Hoehn, Jr. February 1966.

New benefit-cost calculations for the Marble Canyon Project, based on current arguments on its economic feasibility. The main differences between these and the ones of the Bureau of Reclamation concern the use of the same rate of return on capital for both Project and alternative, and the location of the latter at one, not two load centers. Since current prices show that a nuclear alternative would cost less for generating peaking power, the Project is not economically justified. Nuclear costs are developed for three cases. For each, the benefit-cost ratio is less than 1:1. The major assumptions are enumerated, and judged biased in favor of the Project. 25 pp.

P-3309 Increasing Returns In Military Production Functions. M. W. Hoag. February 1966.

Text of a paper prepared for the Universities-National Bureau of Economic Research Conference on The Economics of Defense to be held 15-16 April 1966 at the University of Chicago. Two quotations, one from Mao Tse-Tung and one from Charles J. Hitch, are contrasted to pose several questions: Where and why does analytic marginalism apply well to military problems? Where not and why? When must economic analysis establish a relevant resource level before applying marginal cost/effectiveness tests? How can mutual understanding and communication be improved between military professionals and civilian analysts of military problems who apply economic principles in quantitative tests? The author discusses the issues raised by these questions in detail, and stresses the need to improve choices through a combination of military insights and economic theory. 30 pp.

P-3311 United States Interests in Asia. C. Wolf, Jr. January 1966.

Text of a statement before the House Foreign Affairs Committee, Subcommittee on the Far East and the Pacific, 27 January 1966. The author addresses the question of U.S. interests in Asia on a broad, regional level. The two sides of U.S. interests are considered. (1) prevention of a domination of Asia by a single power, or by a group of powers, whose hostility and capabilities might constitute a direct or indirect threat to the U.S.; and (2) the assistance of Asian countries toward economic modernization as open

and stable societies. Also considered are widely held beliefs about current American policies and programs in Asia, and a particular approach toward building cooperation and contacts among the Asian countries. 6 pp.

P-3316 Organizational Structures and Planning. J. R. Schlesinger. February 1966.

Paper prepared for the Universities-National Bureau of Economic Research Conference on The Economics of Defense to be held at the University of Chicago 15-16 April 1966. The author considers the influence of organizational structure on planning in general and examines the type of structure most conducive to successful planning in particular. Emphasis is placed on problems of structures and planning in large organizations rather than in small ones. Planning experiments in the Department of Defense since 1961 receive detailed attention and implications of the experience are discussed. 48 pp.

P-3317 Indian Industry--Some Proposed Areas of Research. G. Rosen. March 1966.

A discussion of proposed areas of research on Indian industry. The most important seems to be the study of the interaction of industrial and agricultural sectors to determine what has been happening to rural demands for industrial goods since 1950, and to find means to expand rural consumption of industrial goods. Other areas of research proposed are an investigation into the operation of public sector industries and private industries to improve them, and a study to test certain key assumptions behind industrial planning in India. 5 pp.

P-3335 Tariffs and Economic Development: A Comment. L. L. Johnson. March 1966.

Discussion of the effects of technical change in protected industry. The author finds that, while technical change may provide opportunities for new kinds of commodity substitutions that may affect a country adversely at first, continuing technical improvement will offset this especially after domestic costs of previous imports are reduced and domestic prices fall below the previously protected level. 7 pp.

P-3336 Risk and the Required Return on Equity. F. D. Arditti. March 1966.

Investigation of the economic principle of expected utility maximization. The study seeks to identify the required or expected return on common stock and its relation to various types of investment risks. The author formulates a model and provides specifications and tests. 38 pp.

P-3338 Simultaneous Interpolation and Parameter Estimation. W. E. Hoehn, Jr. October 1966.

Simultaneous interpolation and parameter estimation, a method of maximizing a likelihood function with respect both to parameters and to certain missing observations, is a relatively unexplored area of research. Here, for the single equation case, numerical estimation procedures are given, along with several numerical estimation examples. The theory is also developed for simultaneous equation systems. This study was prepared for submission as a doctoral dissertation to Northwestern University. 198 pp. Bibliog.

P-3339 Income and Substitution Effects In A Family Labor Supply Model. M. H. Koster. December 1966.

An analysis of income and relative price (wage rate) effects influencing the quantity of labor supplied to the market. Factors influencing labor supply are used as a foundation for the development of a family labor supply model. The purpose of the model is to specify more precisely the nature of income and relative price effects in labor supply equations and to show how coefficients estimated by using various specifications of regression equations can be interpreted. 80 pp. Bibliog.

P-3351 Book Review of 'The Development of Social Overhead Capital In India, 1950-60.' G. Rosen. April 1966.

A review of J. M. Healey's book, 'The development of social overhead capital in India, 1950-60,' 1965. The reviewer believes the book fills an important gap in studies on Indian economic development because it systematically looks at the economics of public overhead investment. Three specific sectors of investment--irrigation, power, and railway and road transport--are analyzed in detail. The results reveal a low rate of financial

return to the government. Reasons for the apparently uneconomic investment program are discussed. Effects of the program on employment are also considered. 4 pp.

P-3353 Book Review: 'Foreign Investment in India,' by Michael Kidron, Oxford University, London, 1965, pp. XVI, 368, 50 sh. G. Rosen. April 1966.

Review of Michael Kidron's book on private foreign investment in India. The reviewer notes that the book is the first to look at the entire subject in a historical, political and economic sense. Previous studies have dealt with individual cases of private foreign investment. Western economists, as well as Indian economists, should find the book especially useful in determining whether India actually benefits from the investments. 6 pp.

P-3356 The Mythography of Military R&D. R. L. Perry. May 1966.

The term mythography applies to the situation in which unreal representation of events and their causation becomes widely acceptable and is eventually transcribed into a procedural ritual. In military R&D, it is not uncommon for casual observations to be transformed into assumptions, which in time become doctrine and ultimately rules of procedure. One example is the assumption that careful preplanning and tight scheduling of complete system developments and the early integration of subsystems result in the earliest availability of fully capable equipment. Another is that an intensively managed concurrent development can markedly accelerate the availability of fully developed systems. The paper argues that prescriptive doctrine and procedure are suspect and that each program should be considered on its own merits and in terms of its own environment. 17 pp.

P-3357 Methodological Problems In Evaluating the Effectiveness of Military Aircraft Development. T. K. Glennau, Jr. May 1966.

Cost data on thirteen military airframes are analyzed in an attempt to establish a relationship between development cost, aircraft attributes, development process qualities, and time as a basis for evaluating the effectiveness of military aircraft development. Among the problems encountered were the difficulty of defining development and measuring its cost, the inability to measure such conceptually important variables as development urgency and state-of-the-art advancement, the failure of the measures adopted to capture all the aspects of product quality that should be considered, and the limited sample size. Despite such difficulties, the study concludes that development time does not seem to influence development costs importantly; that state-of-the-art advance may have a negative relationship to development costs; that there is no evidence of productivity increases of the factors of development being taken out in the lowering of development costs; and that coordination of subcontracting efforts may raise development costs, particularly those associated with tooling and/or production. 20 pp.

P-3367 A Simple Heat Engine of Possible Utility in Primitive Environments. R. B. Murrow. August 1966.

This study recommends that the possibilities of a 'drinking bird' heat engine be investigated to see if it can be further developed into a useful machine to solve the Egyptian low-water-lift problem or to perform other low-power-requirement tasks in primitive environments. The engine is described in considerable detail. Direct experiment has shown that it works on a small scale and does so particularly well under the arid climatological conditions of Egypt and many other underdeveloped countries. 32 pp.

P-3368-1 Preventive Medicine Policies. J. J. McCall. May 1969.

Some potential applications to health care of current methods used to schedule equipment repairs. It is difficult to transfer scheduling policies from physical equipment to human beings, since there are many problems involved in assessing a human being's economic value and in adapting maintenance policies to health care. However, many of the standard equipment models used for scheduling repairs on stochastically failing physical equipment may be modified for use on humans, particularly in the scheduling of dental checkups. A dental scheduling problem is outlined that is applicable to more serious health problems, such as cancer detection. 9 pp. Refs. (EB)

P-3383 Latin American and Indian Political Economy Compared: Some Comparisons Derived from K. B. Griffin's 'Reflections on Latin American Development.' G. Rosen. June 1966.

A comparison of a model of the interrelations between politics and economics in Latin America that is implicit in an article by K. B. Griffin and the

author's model of the political economy of India. The two models are similar in that both use a two sector approach, rural and urban, and both stress the importance of rural-urban resource flows as well as the need for rural-urban coalition groups for political bargaining. The major differences between the models are pointed out, namely, the absence of an ethnic factor in Latin America; the heavy concentration of landownership in a few hands in Latin America; the exercise of political power by rural groups in India (a power denied the rural groups of Latin America), and the fact that resource flow between urban and rural sections is reversed in the two areas. Conflicting conclusions about future policy result from these differences. 16 pp.

P-3388 Problems in Evaluating Latin American Development. L. L. Johnson. June 1966.

Comment on an article, 'Reflections on Latin American development,' Keith B. Griffin, *Oxford Economic Papers*, March 1966. Three aspects of the article are discussed: sources of Latin American development; distribution of income; and alternative possibilities for reform. In contrast to Griffin's analysis, evaluation of past sources of Latin American economic growth reveals that foreign investors in Latin America do not necessarily receive all the profits from their investments, that the problem of uncertainty about future foreign exchange earnings from exports is a problem that merits more attention than the prospect that long-run trends will be unfavorable, and that manufacturing as a source of future growth in Latin America will depend largely on foreign investment and imported entrepreneurship, with greater reliance on domestic investors as the economy becomes more highly developed. Wide variations in the distribution of income in the agricultural sector reflect the absentee landlord's difficulties in effectively delegating responsibility and the threat that technical change offers in mobilizing his resources. Contrary to Griffin's hypothesis that organized labor-intensive rural investments in China help to mobilize the masses for development, indications are that the Chinese experience has not been an unqualified success. 24 pp.

P-3390 On the Cost-effectiveness Approach to Military R&D: A Critique. K. Knorr. June 1966.

A study that states the main limitations and hazards of the cost-effectiveness approach in clarifying military choices, develops some aspects of the management problem raised by these limitations and hazards, and reviews these aspects with special reference to R&D decisions. It is emphasized that exaggerating the assistance that the cost-effectiveness approach can give to the policymaker is particularly dangerous in the case of R&D choices. Empirical studies of the values and dangers of CE guidance are recommended. 12 pp.

P-3393 The Strategic Consequences of Nuclear Proliferation. J. R. Schlesinger. June 1966.

Stressing the distinction between political and strategic consequences, the author contends that the strategic importance of proliferation has been exaggerated. This results from viewing the problem quantitatively in terms of the number of nations that might acquire a small capability, rather than qualitatively in terms of the destructive potential that might be achieved. The United States and the Soviet Union can be expected to remain in dominant positions in any nuclear confrontation; their central strategic balance could continue to provide stability in regional conflicts, even in the face of nuclear spread. 20 pp.

P-3407-1 Quasi-Equilibria in Markets with Non-Convex Preferences. R. M. Starr. November 1967.

Classic mathematical approaches to the proof of existence of general equilibrium have assumed that every consumer maximizes utility under budget constraint, regardless of the number of consumers in the market. Such approaches fail to take advantage of the friction (lack of a completely smoothly working market) that has been built into the system. This study develops a quasi-equilibrium model, eliminates the common convexity assumption, and shows that if the number of traders is sufficiently large, there is a configuration under which divergence from equilibrium can be made small relative to the size of the market. 29 pp. Bibliog.

P-3414 Operations Research on Urban Problems. F. T. Moore. June 1966.

A consideration of the value of operations research in different areas of social welfare. Some analysts feel that their systems should be widely used; others

believe that various substantive constraints nullify their best efforts. The problem is to define the characteristics of those projects for which the techniques are particularly suitable or which contain severely restrictive difficulties. The trade-offs between social, economic, public, and private benefits are discussed. 9 pp.

P-3417 Problems of Estimating Military Power. A. W. Marshall. August 1966.

Mere tabulations of military forces are not meaningful estimates of military power, which is always relative to the military posture of some other country or alliance. Until we understand the decisionmaking process within typical military bureaucracies and take account of the political balancing, coordination problems, information flow, conflicting objectives, etc., we cannot effectively forecast future military postures beyond the four to five years decisively determined by present military commitments and inertia. Models of the decisionmaking behavior of a military organization should treat it as an adaptively rational multi-objective process, rather than an omnisciently rational single-objective process like that shown in the SAFE force planning game. This Paper was prepared for presentation to the American Political Science Meetings in New York, 6-10 September 1966. 22 pp.

P-3422 Rebellion and Authority: Myths and Realities Reconsidered. N. Lentes. C. Wolf, Jr. August 1966.

An attempt to clarify the vocabulary and theory presently associated with insurgency problems, and a discussion of an alternative approach to insurgency through analysis of rebellion as a *system* and as an *organizational technique*. It is concluded that control of insurgency should be separated from all other problems of less developed countries, and that it should not be viewed as identical with nationbuilding and with economic, social, and political development in these countries. 14 pp.

P-3425 Red China Builds an Airline. H. Porch. August 1966.

Discussion of the development and current status of civil aviation in Communist China, based on data drawn from the open literature. The Chinese Communists have moved slowly in expansion of air service and development of an aircraft industry. It is concluded that domestic services, route patterns, and the amount of specialized services will need much improvement before the Chinese civil air fleet will pose a threat to other airlines in Southeast Asia or have an impact on transportation in any military campaign. 18 pp.

P-3433 An Experiment in Understanding: The Harvard Program, Two Years After. E. G. Mesthene. September 1966.

Current directions of the Harvard University Program on Technology and Society. The Program, established in 1964 to inquire into the effects of rapid technological change on society and the reciprocal effects of social change on technological developments, is presently concerned with investigations in the following fields: (1) the social implications of biomedical technology; (2) information technology and the process of education; (3) the interaction of technological and social change; (4) work and employment; (5) institutional processes of adaptation to change; (6) technology and business; and (7) science and democracy. 32 pp.

P-3438-1 Cost-based Pricing and Labor Elasticity. F. D. Arditti, M. J. Peck. September 1967.

An examination of the impact of cost-plus pricing on variation in labor inputs. A simple profit maximization model is used to demonstrate why defense project cancellation leads to an overall employee reduction significantly less than the numbers involved in the project. In particular, it is shown that the lower labor elasticity of the aircraft industry adds to its labor costs. 23 pp.

P-3454 The Norm of a Closed Technology and the Straight-Down-the-Turnpike Theorem. S. G. Winter, Jr. September 1966.

An attempt to distinguish between classes of exceptions to the usual turnpike theorems of maximal economic growth and to show the mathematical unity underlying the diversity of turnpike theorems in econometrics. The turnpike theorem requires that the asymptotic return locus touch the transformation surface only at the eventual output point. The straight-down-the-turnpike theorem demands that it touch the transformation surface only at a point where the latter touches the isoquant. 37 pp. Refs.

P-3459 Variable Sweep: A Case History of Multiple Re-innovation. R. L. Perry. October 1966.

A review of the early design and flight experience of variable sweep aircraft. The key patents and design trends that ultimately led to the TFX competition, the F-111, and the proposed Anglo-French variable geometry fighter are discussed. 16 pp.

P-3464 Systems Analysis and the Political Process. J. R. Schlesinger. June 1967.

An evaluation of the role for systems analysis in a highly political environment. Four aspects are considered: (1) general limitations; (2) the relevance of the experience in the Department of Defense; (3) bureaucratic problems in a wider compass; and (4) what systems analysis can accomplish. The Department of Defense, in contrast to other components of the bureaucracy, is so structured that the introduction of systems analysis and program budgeting was relatively easy. However, in the more politicized environment of the civilian programs, the DOD experience may prove to be a rather inexact model for what will actually take place. Nevertheless, systems analysis, in sharpening and educating the judgments and intuitions of those making decisions, will begin to reshape the way that agencies view their problems. By introducing numbers, systems analysis serves to move arguments from the level of ideology or syllogism to the level of quantitative calculation. 31 pp.

P-3471 The Party of Big Business and the Party of the People: A Note on Trends in the Corporate Profit Share. S. G. Winter, Jr. October 1966.

An economic analysis of trends in the corporate profit share under the Truman, Eisenhower, and Kennedy-Johnson administrations. The two parties are compared with respect to their apparent impact on profits at given levels of slack in the economy. The method of least-squares is used to estimate the coefficients of a regression equation relating a profit share variable to measures of economic slack and trend terms. The coefficients of the trend terms are then examined. The data are annual figures for the period 1947-1965 in one-half of the cases and for 1948-1965 in the other half. 12 pp. Refs.

P-3482 The Causes of Slavery: A Hypothesis. E. D. Domar. September 1967.

This discussion of the cause of agricultural slavery revives and expands the postulation that sparse population and a need for a non-working class of owners forms the basis of slavery. So long as land is abundant and capital requirements low, free labor will be scarce or nonexistent. With labor tied to the land, the landowner can then extract rent from the slave (not the land) by appropriating his income above the subsistence level. Until the difference between free and slave productivity is greater than the difference between free and slave costs, slavery will not die out. This is more likely to happen in an agrarian society, without technological progress and capital accumulation, as land becomes scarce. 14 pp.

P-3496 Book Review: Roy D. Laird and Edward L. Crowley, Editors, 'Soviet Agriculture: The Permanent Crisis,' New York, Praeger, 1965. Nancy Nimitz. December 1966.

A brief unfavorable review of the Laird-Crowley book containing the papers and background reports presented at the February 1964 symposium at the Institute for the Study of the USSR in Munich. Written after the bad harvest of 1963 and before Khrushchev's removal, several of the papers are complacently dismal in tone. The title reflects a general tendency to underestimate the adaptability of the Marxist system. Specific errors and shortcomings are listed. 2 pp.

P-3505-1 The Grand Canyon Controversy: Lessons for Federal Cost-Benefit Practices. A. Carlin. October 1967.

A review and analysis of the economic controversy over the proposed Grand Canyon dams. Several Federal evaluation practices not fully developed in previous analyses of Senate Document 97 are pointed out: use of the wording 'most likely' to exclude lower cost alternatives from consideration; inclusion of taxes and higher interest rates in evaluating a private alternative; unreasonable assumptions with regard to transmission costs of alternatives; inadequate interest used in computing cost when rates are relatively high. However, the real problem is more likely to be the political realities of the situation than ignorance of economic principles. 25 pp.

P-3510 The Peaceful Neutron Bomb: A New Twist on Controlled Nuclear Fusion. S. T. Cohen. June 1967.

By utilizing the ability of fusion neutrons to produce fission in U^{238} , 100 tons of fission energy can be produced with a blast containment problem of only 1 ton as opposed to 20 tons in a pure-fusion system. Compared to a nuclear fission reactor, this system would be safer, more efficient, far less costly, and would 'breed' valuable new isotopes. Even so, the secrecy surrounding pure-fusion research in the U.S. and Russia make its availability for peaceful uses in the near future unlikely. 13 pp.

P-3511 Rated Association Values of 251 Colors. S. W. Cochran. January 1967.

Results of a color association test of 100 male and 100 female students in psychology classes at three Colorado coeducational colleges. Shown booklets in which squares of each of 251 colors were displayed in random order, the subjects rated each as to the number of things and ideas it made them think of, from None to Very Many. Females reported more associations than males, but ratings among the colors were the same (correlation of .91). The colors with highest association values were the whites and off-whites, the blacks, and some strong colors with high chroma. The seven highest rated were, in order, a dark red, white, bluish white, black, greenish white, another black, and deep blue. The association value of colors should be taken into consideration when color is used as a variable in learning experiments. 13 pp.

P-3514 Das Kapital: A Centenary Appreciation. E. D. Domar. December 1966.

Discussion at the American Economic Association Meeting in San Francisco, December 29, 1966. The economic doctrines of Marxism are discussed in the context of Marx as a revolutionary whose purpose was to build a scientific foundation for the overthrow of capitalism. 4 pp.

P-3519-1 Secular Equalization and Cyclical Behavior of Income Distribution. T. P. Schultz. November 1967.

A model for examining Kuznets' classic theory that in more developed countries the size distribution of income among persons and among families has become less unequal during the 20th century. The model incorporates cyclical factors that are hypothesized to displace the distribution of income from its secular or equilibrium trend. Annual personal income data from the Netherlands are used to estimate the model and to test the implicit hypotheses. The study shows that (1) income inequality has decreased markedly in the Netherlands during the last 50 years; (2) secular equalization stems from the increased labor share of income and its more equal distribution; (3) the secular trend is stronger when variation in income associated with age and sex are eliminated; (4) aggregate disequilibrium in factor markets that induce cyclical change in price and employment levels appears to account for much of the behavior of income inequality; (5) the distributional effect of changes in the price level has reversed and the effect of change in labor productivity has increased in the period since World War II. 26 pp. Refs.

P-3541 The Grand Canyon Controversy, or, How Reclamation Justifies the Unjustifiable. A. Carlin. April 1967.

An analysis of the economic guidelines used by Federal agencies to justify hydroelectric projects. An alternative method of generating the power is chosen—not necessarily the least-cost alternative—and its costs are referred to as the 'benefits' of the proposed dam. Bureaus do not have to estimate the alternative costs by the same methods and are specifically directed to use a 3-1/8 percent interest rate for project funds but 'likely' rates for the alternative. If the 'benefit'/cost ratio is more than one to one, the project is justified. Many hydro projects have failed to repay their costs. The Grand Canyon dam controversy is probably the first time a Federal water resource agency has had to defend its procedures against the reforms long advocated by outside economists. There is little hope of change until the Executive Branch of government takes available steps to control its water agencies, or the taxpayers organize an effective lobby to protect their interests in public works appropriations. 8 pp. (See also P-3505, P-3546, P-3548.)

P-3542-2 On the Separation of Production from the Developer. F. D. Arditti. June 1967.

An improved method for estimating the costs of transferring industrial production from the developer to some other producer and the optimal time

for the separation. The basic tool is the learning curve—in this case, curves relating man-hours per pound to aircraft produced, compiled by Wright-Patterson AFB. A 'shift factor' to be applied to the co-producer's curve intercept and slope was derived from experience with five aircraft. For separation to be economically sound, the co-producer's productivity must be great enough to overcome the original developer's advantage of experience. The two cases of real postwar aircraft co-production in the U.S. were analyzed. The analysis shows that feasibility of transfer varies with the situation. This opens the possibility of cruder competition with resultant savings to the Government in military procurement. 23 pp. Refs.

P-3545 On Relating Non-technical Elements to System Studies. J. R. Schlesinger. February 1967.

This Paper speculates on the inherent limitations of traditional methods of system analysis that neglect nonmilitary factors, and considers whether the structuring of such studies has contributed to policy failures. The Paper asserts that: the omission of broader political and social factors is an inherent limitation in military systems studies; such self-imposed limitations are defensible in the attempt to deal (suboptimally) with a critical portion of the overall problem; the chief difficulties arise in the transition from these studies to decisionmaking; major systems studies inevitably contain a number of implicit non-technical assumptions; using specialized studies without examining non-technical factors leads to incomplete results and inadequate conclusions. 34 pp.

P-3546 The Grand Canyon Controversy --1967: Further Economic Comparisons of Nuclear Alternatives. A. Carlin, W. E. Hoehn, Jr. March 1967.

An updating of P-3302 and Congressional testimony by the authors against the Grand Canyon dam projects. Calculation methods have been changed to credit the proposed alternative nuclear power plants with the Federal Power Commission's regular energy value adjustment: half the savings from replacing more expensive steam-generated peakload power. Also, cost-benefit ratios are given at both 3-1/8 (Bureau of Reclamation figure) and 5 percent interest rates. Nuclear plant costs were deliberately overstated for unavailability—if the paper were intended to evaluate current nuclear power economics for private utilities, the authors would endorse figures at least \$10 per kilowatt lower. Nevertheless, this analysis finds the benefit/cost ratios of the dams to 0.52-0.78 to one compared with the nuclear alternatives. The higher the interest rate, the greater the difference, because the dams are more capital intensive. 18 pp. Refs. (See also P-3505, P-3541, P-3548.)

P-3548 What the Parsons Study Really Says about Nuclear Power Economics: The Grand Canyon Controversy, Round 2. W. E. Hoehn, Jr. March 1967.

One of a series on the Grand Canyon dam controversy, this paper analyzes the validity of a comparison of nuclear and hydroelectric power plants made for the Arizona Interstate Stream Commission by Ralph M. Parsons Co. in 1966. The Parsons study assumes use of an obsolete reactor type and an unrealistic transmission system. Costs of land, plant, equipment, working capital, and nuclear fuel are shown to be overestimated by many millions, while hydro costs are underestimated similarly. Estimates of nuclear-plant revenues assume a kilowatt-hour sales price that is half what users now pay for electricity. Hydro plant revenue estimates assume much higher kilowatt-hour prices and continuous operation at full rated capacity. Estimates of dam construction cost are 10 to 15 percent under reality. Costs of reregulating the Colorado River and compensation for using Indian reservation land are ignored, as is the \$4.75 million fuel-equivalent annual water loss by evaporation. 26 pp. Refs. (See also P-3302, P-3505, P-3541, P-3546.)

P-3552 A Note on Stability of Outcomes With Vote Trading. R. E. Park. March 1967.

It has been asserted that there is ordinarily a stable equilibrium outcome to a vote trading situation with many decisions and many voters. Based on certain assumptions, two theorems are proved that cast doubt on the validity of that assertion: (1) For an outcome to be stable with vote trading it must be identical with the outcome without vote trading, and (2) If vote trading is 'beneficial' in the sense that some majority set can improve the payoffs to all of its members over those without vote trading, there is no stable outcome with vote trading. 8 pp. Refs.

P-3555 Urban Water Supply--A Second Look. J. Hirschleifer, J. W. Milliman. March 1967.

Opinions expressed in the 1960 study by Jack Hirschleifer, Jerome Milliman, and James De Haven, *Water Supply, Economics, Technology, and Policy*, are commented on and extended. The study discerned a consistent pattern of underpricing and overbuilding in water supply. Rational reallocation of existing supplies, such as would occur if prices were raised in response to scarcity, is not considered as an alternative to new construction. Reviewing the record on decisions made on water supply for New York and Southern California, the authors conclude that economists should place lower priority on advising administrators and focus, rather, on devising institutions whereby fallible and imperfect administrators may be forced to learn from error. 16 pp. Refs.

P-3557 Nuclear Spread: The Setting of the Problem. J. R. Schlesinger. March 1967.

When the capabilities available to nuclear aspirants are carefully scrutinized, the dimensions of the proliferation threat may not warrant the note of desperation often heard. U.S. scientists and politicians have seriously understated the staggeringly high costs for a country to achieve a serious military nuclear capability, and the limits of resources, engineering skills, and production facilities. Nations such as India might be lured into military nuclear efforts by such drastic underestimation of the true cost. Possession of fissionable material is only a short step on a long road. Moreover, nuclear capability has not been associated with political success during the 1960s. Advanced industrial countries cannot be denied peaceful nuclear energy, and U.S. refusal to help would only inspire resentment. The real threat is to the small and less-developed countries of the third world: some might seek a primitive nuclear force for purely local use. Less-developed countries could be prevented from having even simple nuclear facilities, but only if all the nuclear powers and advanced nations cooperated in withholding the components and technology. (Prepared as an address to the regional American Assembly, meeting at Notre Dame, March 1967.) 22 pp.

P-3566 The Use of Aviation in Agriculture and Forestry in Communist China. H. Porch. April 1967.

A survey of the extent to which Communist China uses aircraft as an aid in agriculture and forestry. The first reported use of small aircraft was in 1952 when aircraft patrolled the forests watching for fires and signs of insect infestation. The An-2S aircraft used in specialized operations has been built in China since 1957. From the limited information available, agricultural aviation seems well established in China. Regional teams and individual cropdusters work with, or perhaps under, the regional or provincial bureaus of the civil airline. It is estimated that only about 4 million acres were treated by aircraft in 1966. For a country as large as China, the assigned 200 aircraft in use are not enough to be a very effective aid to agriculture except in local areas. 14 pp.

P-3572 The Impact of Communications Satellites on the Television Industry. L. L. Johnson. April 1967.

In considering such questions as how satellite systems are to be financed, when they should be introduced, and for what purposes, this Paper deals with three separate classes of satellite technology and their implications for the television industry: (1) a 'distribution' satellite that could be available by 1970 to distribute television programming to relatively large ground receiving stations tied into existing local broadcasting and community cable systems; (2) a more advanced technology involving 'quasi-broadcast' satellites that could transmit many channels directly to homes (but at a cost that would make this attractive only in nonurban areas); and (3) a yet more advanced technology involving 'full-broadcast' satellites that could transmit directly to homes throughout the United States at very low cost. 18 pp.

P-3574 European Security and the Nuclear Threat Since 1945. J. R. Schlesinger. April 1967.

An interpretation of the revolutionary changes that have taken place in Europe's strategic configuration since World War II, changes reflecting the partial disintegration of the traditional nation-state system and the creation of powerful strategic nuclear capabilities. While the European states have achieved a level of prosperity that provides an illusion of power, their military weakness relative to the United States has increased, and so has their need for U.S. military protection. While originally NATO was envisioned as a 'grand alliance,' it is now overwhelmingly dominated by its most

powerful partner. To provide a sufficient deterrent, a nation must be able to employ a number of options. European states would be risking too much and threatening too little to be taken seriously. Basically, they prefer safety to a risky and specious independence, the growing disinclination to question the validity of the American commitment reflects the growing recognition that there is no serious alternative. 25 pp.

P-3586 Public Administration and the Contemporary Economic Revolution. B. H. Klein. March 1967.

This Paper views some of the fundamental limitations of systems analysis, and attempts to point out some possible new dimensions for political economy and public administration involving a better understanding of bureaucratic behavior. It is claimed that little of the contemporary economic revolution is relevant to problems of public administration; i.e., the problem is not lack of funds, but finding ways for public organizations at all governmental levels to make better decisions about spending available funds. 18 pp.

P-3601 Recent Structural Changes and Balance of Payments Adjustments in Soviet Foreign Trade. O. Hoeffding. May 1967.

Based on official USSR statistics of its merchandise trade and U.S. statistics of world trade, an analysis is made of the means by which the USSR overcame its acute balance of payments problem of 1963-1965. Although the hard-currency trade deficit was small by U.S. or British standards--about half a billion dollars in the worst year, 1964--it was quite large relative to the size of Soviet hard-currency trade. To make up for large wheat purchases from Canada, Australia, and the U.S., the Soviet Union managed to increase its trade balances with western Europe and Japan by 318 million rubles, to decrease its other imports from capitalist countries, and to change from an exporter to an importer of food from other Communist countries. Consumer austerity was not imposed. Producer goods bore the brunt of import restrictions. Sales of platinum, silver, and diamonds comprised nearly half of the total increase in hard-currency exports. The figures suggest that the USSR may systematically rely on the management of its commodity reserves rather than on gold and foreign exchange in balancing its external accounts. 36 pp. Refs.

P-3610 Inequality and Insurgency: A Statistical Study of South Vietnam. E. J. Mitchell. June 1967.

A statistical analysis of the relationship between land distribution and insurgency in South Vietnam. In contrast to the theory that inequality of land distribution contributes to insurgency, the analysis reveals that the secure province in South Vietnam from the point of view of government control is one in which few peasants work their own land, distribution of land holdings is unequal, land redistribution has not been carried out, and large French landholdings have existed in the past. The population density is high in such provinces and mobility and accessibility are low. 23 pp.

P-3618 Clandestine Diversion of Source Nuclear Materials in a Power Reactor. W. E. Hoehn, Jr. June 1967.

Clandestine diversion of nuclear material in strategic quantities is impractical and, since alternative methods of acquiring it exist, refinement of safeguard techniques would not solve the problem. Our funds and effort should be directed toward research on halting the spread of nuclear weapons and on convincing countries with limited needs that possession of a few nuclear weapons will not meet their strategic requirements. 7 pp.

P-3639 Some Implications of New Communications Technologies for National Security in the 1970s. L. L. Johnson. September 1967.

An overview of technological development in communications, with emphasis on the potential contribution of communication satellites to national security. Satellite systems can be used for necessary communication in international crises and for command and control in wartime. Broader implications discussed relate to open and closed societies, centralization and decentralization of decisionmaking functions, and the process of bargaining and negotiation. 24 pp.

P-3649 The Development of *Hauptauschüsse und Ringe* in the German War Economy. E. R. Zilbert. August 1967.

An examination of the development of the *Hauptauschüsse und Ringe* (Main Committees and Rings) responsible for maintaining German war production. Albert Speer of the Ministry of Armaments and War Production is generally credited with introducing this administrative reform which,

together with his principle of self-regulation or self-administration of industry, resulted in large increases in military production from 1942 through 1944. The evidence suggests, however, that institutional forms closely resembling the Main Committees and Rings were in existence during the Weimar Republic and were evolving in response to the changed economic and political climate introduced by the National Socialists. 17 pp.

P-3654 Agriculture in the Industrialization of Communist China and the Soviet Union. A Comment. Nancy Nimitz. August 1967.

Agriculture in the industrialization of Communist China and the Soviet Union is discussed in the context of Stalinist development strategy and the role of collectivization in a Soviet economy. Indications are that within a Soviet environment, the future as well as the past belongs to collective farms. The argument for collectivization may be stated thus: a short-run triumph, involving increasing penalties in the medium run, but the most expedient solution in the long run for a country that professes adherence to Marxist principles. 7 pp. Refs.

P-3646 A Proposal for Wired City Television. H. J. Barnett, E. A. Greenberg. August 1967.

A national system of wired city television is proposed as a means of providing programs that educate, inform, and entertain specialized interests as well as appeal to mass tastes. Additional channels would be available for educational television, pay-TV, political uses, credit purchases, and an almost indefinite list of other functions. The cost would be low, and the system would free the present TV spectrum for other vital private and governmental purposes. 37 pp.

P-3674 Consumption Cooperation in Rural Areas in the USSR: A Comment. Nancy Nimitz. September 1967.

A comment on the question of price discrimination against the peasant consumer in the USSR cooperatives. The rural price differential of 2.8 percent in the late 1950s, largely warranted by higher distribution costs, was eliminated between 1960 and 1966, resulting in savings to the rural consumer of about 700 million rubles a year. Membership in cooperatives is voluntary, but the member is entitled to special goods and services. About 20 percent of rural consumers who go to the town to buy in the better-stocked stores, also go to sell produce at higher collective farm prices. In general, discrimination does not exist in price but in the paltry assortment of basic goods available. 8 pp.

P-3676 The Public Interest in Public Television. S. S. Alexander. September 1967.

The proposal of the Carnegie Commission for Educational Television to build, with Federal support, a public broadcasting system, provides the basis of this examination of the suitability of and necessity for social scientists to deal with questions involving value judgments—an area of inquiry they have resolutely avoided. Reasonable, moral men, through rational inquiry, can agree on what is 'in the public interest,' but this will often challenge generally accepted values. Although the attempt to achieve excellence rather than acceptability must be made, the real question is whether Congress will, or can, continue support of an institution which does so. (Presented at a Conference on the Use and Regulation of the Radio Spectrum, held at Airlie House, Warrenton, Virginia, September 11-12, 1967.) 52 pp.

P-3686 The Ballistic Missile Decisions. R. L. Perry. October 1967.

An outline of decisions concerning ballistic missiles from the reaction to the German use of guided missiles in the closing months of World War II in Europe through the enunciation of a new set of national strategic principles during the U.S. presidential campaign of 1960. It is emphasized that technology alone, or its failure, has not yet been decisively important to the outcome of a war, but that this may not hold for the future. A faulty reconciliation of technology with strategic goals, or disrespect for the strategic implications of weapon decisions, could have catastrophic effects. 29 pp.

P-3694-1 The Technology Gap: Analysis and Appraisal. R. R. Nelson. December 1967.

An examination of the technological gap between the United States and Europe in the context of its historical perspective and postwar developments. The 'gap' is not new but has existed since the nineteenth century. It has been erroneously viewed by some as a single phenomenon created by increased

world trade, increased U.S. direct investment in Europe, growing U.S. power in science, and U.S. military dominance. Analysis shows that the military and general economic consequences of the gap are separable, and that the technological spillover from massive military R&D is negligible. Although universal education and large markets are important, competition is a most important factor in fostering overall technological progress. 34 pp.

P-3718 New Directions In Regional Research and Policy. A. H. Pascal. November 1967.

A discussion of present research requirements for regional development programs. More definitive information and analyses are required in these areas: geographical distribution of population and economic activity, social and cultural obstacles to economic development, and intergovernmental conflict as it relates to regional development. 7 pp.

P-3720-1 International Productivity Differences in Manufacturing Industry: Problems with Existing Theory and Some Suggestions for a Theoretical Restructuring. R. R. Nelson. January 1968.

An examination of the formal theory purporting to explain international differences in output per worker in manufacturing, particularly differences between developed and underdeveloped countries, and suggestions for a theoretical restructuring to explain these differences. A case is presented for abandoning two central assumptions of existing theory—that all firms can be considered as on the same neoclassical production function, and that factor markets are perfect and competitive. The technological lead, product-cycle theory suggests a different analysis: Manufacturing development should be modeled on an inter- and intranational diffusion process. An empirical analysis of productivity differences between the United States and Colombia supports the argument. 53 pp. Refs.

P-3726 Relating Rebellion to the Environment: An Econometric Approach. E. J. Mitchell. November 1967.

A proposal that econometric methods be used to test theories about the determinants of rebellion. A 'rebellion equation' can be estimated directly, provided the variables are exogenous—that is, determined by factors other than rebellion. If it is assumed that this equation, presenting a measure of rebellion on one side and exogenous variables on the other, can be approximated by an equation linear in the parameters, then simple least-squares linear multiple regression can be applied to estimate the parameters and to test hypotheses concerning them. This approach has been used in Vietnam and is now being applied to the post-war Huk uprising in the Philippines. 8 pp.

P-3734 Computer Simulation in Urban Research. J. P. Crecine. November 1967.

Restricting the term 'computer simulation' to models which are surrogates for real-world urban processes, this Paper discusses those developed for use in two major areas of emerging research: (1) urban growth, development, and spatial location; (2) local government decisionmaking. It also considers two hybrid efforts aimed at simulating a synthesis of economic, political, and administrative elements of an urban system. The future in the area of decisionmaking appears bright, since progress is being made in the technology for translating abstract ideas, concepts, and symbols into computer language. In the area of urban research, however, a lack of data is limiting development. 27 pp.

P-3736 A Not So Common View of the Ground Transportation Problem. M. Wohl. November 1967.

This Paper suggests (1) that the ground transportation problem, the portion of the trip package during which the traveler is not actually airborne, is capable of significant improvement if the interaction of the multiple socio-economic factors affecting it are considered and (2) that the responsibility for this study and analysis is properly the burden of the air industry. Available data support the theory that a multiport complex served by V/STOL type aircraft (for trips up to 800 miles) would be a more practical and satisfactory solution to present and future problems of airport access, inter-terminal delays, and aircraft queueing delays than rapid-transit systems between central airports and downtown centers. 26 pp. Refs.

P-3737 The Federal Role in Postattack Economic Organization. S. G. Winter, Jr. November 1967.

This Paper, presented at the Symposium on Postattack Recovery sponsored by the National Academy of Sciences, challenges the basic axiom, exemplified in the 'National Plan for Emergency Preparedness,' that direct governmental control of economic activity is a sound, or feasible, policy for the postattack situation. It stresses that the appropriate action described is an alternative, not a complement, to the National Plan and outlines the drawbacks to reliance on controls. Research suggestions are made in line with this view. 18 pp.

P-3745 A Review. William R. Kintner, 'Peace and the Strategy Conflict.' M. W. Hoag. December 1967.

A brief review of Professor Kintner's new book in which the superb soldier-scholar writes like an alarmist. Air General. Fearing imminent Soviet strategic nuclear superiority, he disregards all other considerations, makes unsound extrapolations, and advocates force structures that have already been found wanting in cost-effectiveness studies. 2 pp.

P-3757 Effects of an Income Tax on Labor Supply. M. H. Kusters. January 1968.

An analysis of the effects of an income tax on labor supply and welfare presented in the context of highly simplified models that abstract from problems such as shifts in the distribution of income and other complications introduced by progressivity. The analysis is intended (1) to point out the kinds of labor supply parameters on which changes in labor supply depend when alternative tax changes are considered and (2) to assemble evidence on the welfare cost of an income tax. The evidence on compensated wage rate effects was obtained by studying the dimensions of labor supply for three components of the labor force: (1) hours of work for males; (2) labor force participation rates for males; (3) labor force participation of married women. Although the effect on the allocation of time of a relative price distortion at the labor-leisure margin appears to be very small—except perhaps as it affects the labor force behavior of married women—an income tax can affect consumption-savings decisions as well as the allocation of labor among different kinds of employment. 32 pp.

P-3763 Labor Quality and the International Structure of Labor Productivity and Wages. F. J. Mitchell. January 1968.

An analysis of the hypothesis that labor quality is a key determinant of international differences in productivity and wages. In recent empirical work on the estimation of cross-national production functions, it has generally been assumed that labor is homogeneous, and complemented by a single factor of production, capital. These assumptions lead to a very incomplete explanation of international differences in labor productivity and wages, and account not at all for the systematic variation of wages over industries. This simple capital-labor model can also lead to incorrect predictions about international specialization, primarily because labor quality differs substantially over nations. Attempts to introduce labor quality into the analysis encounter one major obstacle—the absence of data measuring the skills of workers in different countries. The analysis presented in this study shows that a more general model incorporating two imperfectly substitutable types of labor can offer a significant improvement in explaining the overall pattern of labor productivity, wages, and international trade among developed countries and within manufacturing industries. 32 pp.

P-3764 On Reorganizing After Nuclear Attack. W. M. Brown. January 1968.

An analysis of current thinking on the possibility of a U.S. recovery from a nuclear attack that destroys or severely damages all major cities and hundreds of others. The economic viability of the country is not assured even though a major fraction of the physical resources survive. Preplanning for a civil defense mobilization will enable it to proceed rapidly and effectively when needed. A large emergency organization could be indispensable to ensure an effective postattack economic reorganization. Effective civil defense mobilization would tend to produce a 'paragovernmental' agency of several million trained people to manage reorganization problems. A major problem will be the collapse of federal currency, resulting in misallocation of food supplies and fragmentation of resources. Preventive actions could include an option to nationalize the food industry during the reorganization period. Stockpiles of petroleum, metals, chemicals, and medical supplies could be built up for use as additional currency to ensure that the govern-

ment would survive and function. Research and analysis of the requirements for planning a mobilization effort may require modest federal funding for a decade. 27 pp. Refs.

P-3785 Another View of Transport System Analysis. M. Wohl. February 1968.

This Paper, which will be published in the Special Issue of the *Proceedings of the IEEE on Transportation*, examines the components and interworkings of transport systems and indicates some directions for improving our analysis capability. Suggestions are made for designing more realistic models for determining demand for travel, one of the major weaknesses of current efforts, and for improving methods of measuring the performance of a system. Much remains to be done in terms of modification, amplification, and clarification before we will be in a position to embark on large-scale systems studies or projects. 47 pp.

P-3791 National Monetary Sovereignty and International Financial Order. R. Z. Aliber. March 1968.

A consideration of current international financial arrangements and their constraints on the United States. The Special Drawing Rights (SDR), as recently internationally negotiated, will supply a new reserve asset in the form of exchange (but not gold) guarantees. SDR undoubtedly will lessen the demand for dollars as well as gold. A less constraining and more efficient proposal is a worldwide dollar bloc, with an increase in the price of gold. 18 pp.

P-3793 The Day Loc Tien Was Pacified. D. Ellsberg. February 1968.

A description of conditions at one of three neighboring hamlets on the day of the formal ceremony in which the three were to be declared 'pacified' and 'secure' from Viet Cong attack. The situation that has prevailed throughout Vietnam was apparent at Loc Tien. Even in areas of relative security, the Revolutionary Development Cadre teams have had little success in inducing people to make a commitment to the GVN or to resist the Viet Cong. In contested areas, the task is hopeless in that the villagers do not have even minimally adequate security against Viet Cong attack. 25 pp.

P-3795 Big Technology, the Technology Gap, and a Dangerous Policy Pitfall. R. R. Nelson. March 1968.

The technology gap between the United States and Europe is discussed in the context of an alleged massive U.S. support of 'big science and technology,' and of the unprofitable policy that could result from such an interpretation of the situation. Excepting space and defense, U.S. big science is probably less involved in creating a technology gap than most Europeans seem to believe. Association of the economic progress of the United States with large government-financed R&D programs may not only be a mistake, but may also lead European governments to squander resources on similar programs. The United States, in turn, could be led into a meaningless and expensive technological race with Europe. 18 pp. (See also P-3694-1.)

P-3802 Toward a Neo-Schumpeterian Theory of the Firm. S. G. Winter, Jr. March 1968.

An attempt to convert some of the ideas in the first two chapters of *The Theory of Economic Development* into a coherent theory of the firm. Contrary to the conventional theory, no sharp distinction can be made between old and new techniques; there is a continuous gradation from highly routine to highly innovative behavior. The attributes that make the firm a significant entity are its existing patterns of routine activity, its tangible and intangible assets, its recent history, the repertoires of actions available to the individuals involved, and the terms in which they conceptualize the firm and their participation in it. No analysis of equilibrium behavior of an individual firm is possible. A neoSchumpeterian theory of the firm must be historical, dynamic, and, ideally, probabilistic, recognizing that the firm's behavior is shaped by a multiplicity of unobservable factors. Traditional theory is far simpler, but at the price of being simplistic. 23 pp. Refs.

P-3803 A Dynamic Model of Urban Structure. J. P. Cresine. March 1968.

A description of the latest version of the Time-Oriented Metropolitan Model (T.O.M.M.). The model depicts the interaction of variables in an urban system. Three classes of variables are included: an exogenous employment sector, an endogenous commercial employment sector, and a household or population sector. The city is divided into a disjoint and exhaustive set of

areal units in which variables are located spatially. Superimposed is a transportation system providing accessibilities between various activities within the area units. In the formal model of T.O.M.M., the number of areal units is variable and in practice would generally be determined by characteristics of the urban area involved and data availability. 61 pp.

P-3811 Defense Economics in Action in America. M. W. Hoag. March 1968.

An explanation of why and how defense intellectuals, especially but not exclusively economists, have significantly influenced U.S. military policy in recent years, how this influence has been consolidated by important changes in the organization and procedures of the Department of Defense, and why these bureaucratic changes are predicted to survive, despite Secretary McNamara's departure. The combination of (1) simple but pervasive concepts derived from maximization theories, (2) painstaking examination and design of relevant alternatives in systems analyses, and (3) alternatives so structured within our bureaucracy has yielded policy power. (This Paper was prepared for presentation before appropriate groups in Australia and Japan.) 37 pp.

P-3813 Defense Planning and Budgeting: The Issue of Centralized Control. J. R. Schleinger. May 1968.

An examination of the revolution in defense management that began in 1961 with the appointment of Secretary of Defense Robert S. McNamara. One of the most significant institutional modifications was the introduction of the program budgeting system characterized by (1) a format in which plans and budgets are presented in terms of programs and program elements; (2) extensive use of special papers and cost-effectiveness analyses to provide additional aid in deciding how resources should be allocated among programs and program elements; and (3) bookkeeping devices for checking on the Services and Commands to make sure that OSD allocations and decisions are being implemented. Hypothetical effects of the new degree of centralization introduced into the system, and the impact of the new procedures in specific decision contexts, are discussed. (To be published in the monograph series of the Industrial College of the Armed Forces for use in its instructional program.) 70 pp.

P-3824 Public Policy Research and Administration: A Proposal for Educational Innovation. J. P. Crecine. May 1968.

A proposal to the University of Michigan by its Advisory Council on Public Administration for a two-year masters degree program in public administration. With a purchasing power of 22.5 percent of the gross national product and employment of nearly 12 million people, the government increasingly needs more trained top-level administrators than current graduate programs can produce (fewer than 1000 yearly). Also, graduates face obsolescence in skills due to educational and research lags in their field. The proposed program would provide two terms of full-time course work in analytic tools and decisionmaking techniques, a practicum as a salaried summer employee in a governmental unit, and two terms of applications to actual government problems. Supporting the program would be an interdisciplinary fundamental and applied research program, a certificate program for mid-career and continuing professionals, and recruitment of students from a wide range of academic interests. 23 pp.

P-3825 Japan-U.S. Relations and Asian Development Problems. C. Wolf, Jr. April 1968.

A discussion of current economic concepts of regionalism and 'second-best' worlds as they relate to problems of United States and Japanese aid programs in less-developed countries. Multicountry associations have been formed for many purposes with varying success. In the economic field, the most reliable criterion for membership appears to be common purpose combined with divergent capabilities rather than geographical proximity. In spite of some differences, both United States and Japanese aid programs confront the same basic problems in understanding and influencing development in the less-developed countries. Experience seems to indicate that people, policies, and politics, not investment, are the controlling factors. This paper was prepared for a conference on Japan-U.S. Relations and Asian Security Problems held April 1-4, 1968. 8 pp.

P-3846 An Analysis of Venezuelan National Income Statistics: Sources and Methods. R. A. Butler, B. Herck. May 1968.

An examination of the methods and sources used by the Banco Central of

Venezuela for preparation of the national expenditure, product, and income accounts. Although few variables have been collected consistently, and there is a wide range in data availability, Venezuela is among the most advanced of the developing nations in the collection and presentation of its national accounts. It is suggested, based on a detailed study of each variable in three accounts, that data for the previous years be consistently revised to enable the investigator to prepare a set of national accounts covering more than a few years. Census results from 1961 and 1963 on population, agriculture, and manufacturing should be used as quickly as possible to obtain new coefficients, to be compared in turn with those since the 1950 and 1953 censuses. Variable coefficients would result simply from comparing end points and calculating a logarithmic growth rate to them, leading toward an approximation of the real world. 102 pp.

P-3852 Asian Futures. C. Wolf, Jr. May 1968.

The text of an interview for Japan's *The Kokuhon* predicting some effects from President Johnson's announcements of the bombing cessation and his withdrawal from the presidential race: (1) reduced political schism in the U.S.; (2) a temporizing (if any) response from North Vietnam; (3) a fracturing rather than a strengthening of South Vietnam; (4) favorable worldwide opinion, blurred by announcements of bombing up to the 20th parallel and an additional 13,500 troops; (5) unfavorable reaction in Korea, Taiwan, Thailand, and Australia. Serious negotiations are doubtful before the American elections, and then the primary emphasis should be on enforcement instrumentation, with ideological gains secondary. Two lessons from the war are to avoid turning insurgencies into conventional wars and to use tolerance with persistence in improving a government's effectiveness. A major possible effect of the war may be U.S. isolationism so as to deal with domestic issues. The problems are solvable, but they will take time. 14 pp.

P-3862-1 An Economic Model of Family Planning and Fertility. T. P. Schultz. July 1968.

A description of an economic model of family planning and its application to explain differences among municipalities and over time in birth rates in Puerto Rico. Beginning with the preferences of parents for children, the model seeks the determinants of birth rates among environmental factors that influence the goals and planning of parents. The hypothesis is set forth that the frequency of births in a population can be understood in terms of three groups of factors: (1) the family size goal, (2) the incidence of death, and (3) uncertainty in the family formation process where births, deaths, and remarriage are unpredictable. Pooling a time series of cross-sections for 75 municipalities in Puerto Rico, strong support is obtained for this hypothesis and its approach to population growth study. 52 pp. Refs.

P-3877 New Directions for Passenger Demand Analysis and Forecasting. G. Kraft, M. Wohl. June 1968.

A discussion of the significant issues involved in developing a model that will help to evaluate alternative transport programs in terms of the changes they may evoke or to justify a program on the basis of reliable forecasts of the values associated with the project. The demand model described, incorporating direct and cross-elasticities, permits both the total amount of tripmaking and the split among modes to be altered as the trip price or travel time for any mode is changed, and treats trip decisions as simultaneous and inter-related. A satisfactory model must also recognize that travel decisions are derived from a large number of socioeconomic factors and that there are a relatively large number of alternatives available to the traveler in terms of purpose, mode, time, route, price, etc. In addition, for forecasting purposes, the model must interrelate demand and price/performance functions and recognize the interaction between the increase in tripmaking as service improves and the build-up of congestion and reduction in service as the volume increases. Lastly, the long-term influence of changes in transportation facilities on social and economic development in an urban area should not be ignored. More intensive effort in data collection in this area is required. 61 pp.

P-3878 Optimal Mechanisms for Income Transfers. R. Zeckhauser. June 1968.

The problem of determining the optimal assistance program for the poor is analyzed as a two-move, non-zero-sum game. Negative income tax plans with constant marginal tax rates, and restricted transfer plans, are considered. It is found that despite the administrative problems involved, a multiple-plan program offering at least one negative marginal tax rate plan may very well dominate any negative income tax program that employs positive

marginal tax rates. It may cost less, be preferred by all transfer recipients, provide a greater incentive for work, and yield a more equal distribution of income. 41 pp.

P-3879 Book Review: *Inside Bureaucracy* by Anthony Downs (Boston: Little, Brown, Inc., 1967) J. P. Creane. June 1968.

Downs' book has as its purpose to 'develop a useful theory of bureaucratic decisionmaking.' While the reviewer finds the axioms, laws, and propositions 'packed with interesting and significant research questions and bureaucratic folklore,' he asserts that it 'is really about bureaucratic structure and contains relatively little that is unique about bureaucratic decisionmaking.' In the reviewer's opinion, the 'major shortcoming of the book lies in the disparity between its theoretical 'ambitions' and its actual accomplishments.' In this book there is no theory and the nontestability of the propositions is immediately obvious.' 4 pp.

P-3881 Arms Interactions and Arms Control. J. R. Schlesinger. September 1968.

A consideration of some basic issues in the international arms competition. Arms control policy can be affected by several possible situations involving ABM deployment: (1) difficulty in policing Soviet offensive capabilities; (2) budget and bureaucratic constraints to Soviet military posture changes; (3) a temptation to strike first from fear of ineffective second-strike capability; (4) a superfluity of ABMs due to compensation for performance inadequacies or uselessness of the weapons in other roles; (5) more flexible Soviet policy allowing for a downgrading of ABM capabilities. Arms control objectives should aim at low-level war directed at military targets; a selection of weapons based on strategy; and the inclusion of non-participating nuclear states, without whom the policy is ineffective. A conflict of interests may exist, however, in arms control over the superpowers, whose enormous capabilities have deterred the other nations from a scramble for nuclear weapons. 21 pp.

P-3883 The Theory and Practice of Blackmail. D. Ellsberg. July 1968.

A reprint of a lecture on the logic and rhetoric of threats and ultimatums—the language of diplomacy—delivered by the author on March 10, 1959. Whether it is called blackmail or deterrence, the art of influencing another's choice among alternatives by the use of threats is coercion. To provide a framework for representing and comparing alternatives, a game is developed, employing a payoff matrix, in which the victim has two choices, resist or comply, and the threatener has two, accept or punish. As a rule, a threat has a certain built-in implausibility, that of being costly—or irrational—to carry out. The threatener's problem is to make his threat sufficiently plausible to the victim. He may do so by means of four main techniques: (1) by binding himself irrevocably; (2) by putting up forfeits; (3) by making the victim unsure of what would be rational; and (4) by appearing to be irrational—or, as with Hitler, by *being* irrational. In the last analysis, however, since the estimates of payoffs or risks are subjective variables, the answer to successful blackmail is not within the scope of logic: it is an art. 41 pp.

P-3885 Demographic Conditions of Economic Development in Latin America. T. P. Schultz. July 1968.

An analysis of the demographic causes and consequences of the population explosion in Latin America. About half of the current population is under 15 years old, due to a high level of fertility and a decline in infant and child mortality. The resulting enlarged labor force cannot be absorbed by agriculture, and high rates of internal migration and urbanization are not solutions but responses to the employment problems. There is strong circumstantial evidence that rapid growth of population retards the advance of personal welfare and increases the inequality in its personal distribution compared with a regime of lower fertility and slower population growth. Government policies can strengthen the incentives toward lower fertility rates by (1) improving employment opportunities for women, thereby placing constraints on child rearing and lowering birth rates; (2) fostering universal school attendance, which increases child costs and decreases economic gain from employment of children; (3) allocating more health and welfare program resources to eliminate infant and child mortality, since historical evidence suggests that for birth rates to decline, child survival must improve. 40 pp. Refs.

P-3890 Combining Overlapping Information. R. Zeckhauser. July 1968.

In group or organizational decision problems it is often desirable to combine information derived from different sets of observations. Difficulties arise when there is some overlap in these sets but the data cannot be sifted to identify the overlapping observations. This study presents one formulation of the problem that is encountered when an attempt is made to pool the probability judgments of a number of individuals with some separate and some common experience into a jointly assessed probability distribution. 10 pp. Refs.

P-3905-1 Internal Migration: A Quantitative Study of Rural-Urban Migration in Colombia. T. P. Schultz. October 1969.

A study of Colombia's increasing internal migration, with the use of a model to indicate migratory response to economic, demographic, and political developments in the urban and rural sectors. Responding strongly to urban market forces and population explosion, Colombia's internal migration between 1951 and 1964 caused an urban population growth of about 5 percent, as opposed to a 1 percent growth in rural areas. This pattern could be somewhat reduced by decreasing the incidence of violence in rural sectors, but the growth is a consequence of fundamental forces that are not easily handled. Migration can, in fact, be beneficial toward attaining economic objectives by facilitating structural change in the community and keeping the rural-urban income differences within bounds. Politically, while posing problems by concentrating the poor and unemployed in cities, internal migration apparently contributes to the conservative character of Colombia's urban areas and preserves the status quo. 48 pp. (EB)

P-3906 A Framework for Planning Social Services. A. P. Pascal. August 1968.

An outline of a planning process for social services, prepared for the Task Force on the Organization of Social Services, Department of Health, Education, and Welfare. The first step is to adopt a classification scheme indicating where resource allocation decisions must be made politically and where they ought to be made technically. Functions could be distinguished by major classes, by target groups, by societal objectives, or by a combination of these classifications. Once resources have been allocated, standards to measure achievement and a method for attaining the goal can be determined. There are four general institutional arrangements for furthering a social purpose: (1) The government distributes generalized purchasing power. (2) The government provides a particular social service. (3) An outside institution provides a given service under government contract. (4) The government provides scrip or identification cards that are used to purchase goods or services from competing offerors. Each delivery system has advantages, but the last method, where applicable, goes farthest toward increasing efficiency through competition while maintaining individual freedom. Although each system will have its own criteria for evaluation, sufficient feedback must be provided to allow for self-criticism and adaptive behavior. 11 pp.

P-3912 Minimum Attractive Rate of Return for Public Investment. J. Hirshleifer. August 1968.

A discussion of methods of determining a minimum attractive rate of return for public investments. In order to clarify the fundamental logic of interest, the first part of this Paper considers a riskless world in which there would be no uncertainty and, hence, no distinction between equity and debt securities. In this environment, the present-worth rule for making investment decisions will always work, while the prospective-rate-of-return rule is not consistently correct. In the real world there is a risk distinction between equity and debt financing. In general, the weighted average of the stock and bond yields in the existing capitalization should be used as the discount rate for investments that leave the firm in the same risk-class as before. In the public investment area, the riskless rate can be used, except for variability risk situations comparable to private utility projects, where a compromise rate might be indicated. Where bias, or over-optimism, exists, additional percentage points should be added to the rate. 14 pp.

P-3913 Experience and Evaluation of a Testing Program in an Underdeveloped Area as a Means of Developing a Road Capacity Estimating Method. L. P. Holliday. September 1968.

A report on the results of a series of field tests conducted on roads in Thailand to provide data for the development of a road capacity estimating method. Data accumulated for the five adjoining test routes included road descriptions, photographs, the locations of transition points and bridges,

bridge descriptions (and safety), and altitude readings on the mountainous portion of the course. Multiple correlations between the data on speed, width, terrain, condition, surface day/night, and empty/loaded categories suggest that condition and surface had the most effect on speed and that width and terrain had much less effect. Some of the limitations of this test, such as visual measurement of gap between two trucks, subjective definition of surface condition, and limited combinations of surface, condition, and terrain categories, could be avoided in more extensive tests. For a large test, it might be more feasible and less expensive to operate in the United States. This Paper was presented at the Seminar on Road Capacity Estimating Methods sponsored by the Engineer Strategic Studies Group, U.S. Army Map Service, in Washington, D.C., September 1968. 18 pp. (See also P-3914.) (MIP)

P-3914 The Interrelationship of Factors Affecting Road Capacity. L. P. Holliday. August 1968.

A selective examination of factors which influence the average speed and load maintained (the basic determinants of road capacity) in military cargo truck convoys, part of research aimed at developing a new logical method for estimating road capacity. Considered are physical conditions, such as road width, surface type, and terrain, as well as the regulations governing convoy movement. Certain interrelationships are analyzed, with some simplification, such as letting only surface type affect the truck rate. 19 pp. (CC)

P-3918 An Economic Re-Evaluation of the Proposed Los Angeles Rapid Transit System. A. Carlin. M. Wohl. September 1968.

Examination of the economic justification for a rail transit system for Los Angeles as presented in the *Final Report* of the Southern California Rapid Transit District. The system, covering 90 route-miles, would be financed by a sales tax of one-half of one percent over the next 50 years. The authors conclude that the project is economically unjustified, as costs will exceed benefits. Through economically unsound conception and procedure, the *Final Report* overestimates the number of users on which economic calculations are based; overstates annual benefits by \$80 million; and claims excessive 'community benefits.' Recomputation to adjust the foregoing errors reveals that annual costs would exceed benefits by \$15 million in 1980. The rail transit proposal should be reviewed in comparison with other possible transportation improvements, such as express bus service along special roads to provide direct-connection feeder service; additional cross-town freeways; and substitution of 'free-entry' taxi service for the present franchise type. 19 pp. (CD)

P-3919 Conceptual Models and the Cuban Missile Crisis. Rational Policy, Organization Process, and Bureaucratic Politics. G. T. Allison, Jr. August 1968.

An analysis of the proposition that the maker of governmental policy is not a rational, unitary decisionmaker but rather a conglomerate of large organizations and political actors, and of the implications of this argument for foreign policy analysts. Three conceptual models are developed and applied to the same problem: the Cuban missile crisis and the U.S. decision to impose a blockade on Cuba. Model I (Rational Policy) examines the U.S. strategic calculus: the problem posed by the Soviet missiles and relevant U.S. values and capabilities. Model II (Organization Process) emphasizes organizational constraints in choice and organizational routines in implementation. Model III (Bureaucratic Politics) emphasizes the games, power, and maneuvers of the principal players within the leadership group. The alternative explanations that emerge illustrate the differences that result from the formulation of alternative frames of reference and the opportunities that such formulations offer the analyst in foreign policy research. 69 pp. Refs.

P-3936 New Directions in Organization Theory. T. Hallinan. September 1968.

A short intellectual history of organization theory and an analysis of current trends in the discipline. Two analytical frameworks within five schools of thought are identified. The traditional approach concentrates on the formal, closed-ended aspects (e.g., goals, tasks, bureaucratic problems) of an organization. The other approach views the organization as an open-ended system. Schools within this framework study the informal organizations, such as social pressures, and the organization itself as a problem-solving entity, while de-emphasizing the classical rational-choice theory of decisionmaking. The present rapid growth of the field will probably slow as it develops a limiting paradigm and as its dependency on empirical data increases. 14 pp. (CC)

P-3945 How Much Is Good Health Worth? V. D. Taylor. July 1969.

A consumer demand or subjective value approach to government-provided or -subsidized medical services. The usual cost/benefit or human capital approach is irrelevant to human preferences and actions of decisionmakers. For the nonpoor, government action should generally be restricted to what consumers cannot obtain elsewhere: regulatory actions, control of infectious diseases and pollution, aid to biomedical research. Government activities are worth what people would be willing to pay for them. Services to those who could not pay are justified by the willingness of the nonpoor to pay for them. Giving the poor what they want instead of what some index says they need would better serve the total perceived well-being, since present programs arouse hostility. Direct money transfers to the poor cost far less to deliver than medical services and would probably contribute more to improving health through better living conditions. 38 pp. Refs. (MW)

P-3959 A New Administration Faces National Security Issues: Constraints and Budgetary Options. M. W. Hoag. November 1968.

A consideration of the international and domestic policy constraints that may effect U.S. military planning in the 1970s. A feasible defense budget for the 1970s is constructed that is based on the FY 1965 budget, which was a model of austerity while maintaining large general forces for contingencies. The resulting budget is \$50 billion in 1969 prices, or only about 5 percent GNP of the early 1970s. It reflects hard choices made between policy constraints and indicates a strategic arms freeze, while implying more drastic cuts in military capabilities. Since U.S. military structural changes might have serious repercussions abroad, they could not be adopted without consultation with U.S. allies and, hopefully, in reasonable negotiation with the Soviet Union. Among the international implications to be considered are: (1) prospects of a strategic arms freeze with the USSR; (2) NATO capability and will, permitting U.S. unilateral force reductions; (3) maintenance of the credibility of Asian commitments. 34 pp. (EB)

P-3965 Kahn on Winning in Vietnam: A Review. D. Ellsberg. November 1968.

This review of *Can We Win in Vietnam?*, by Frank Armbruster, Raymond Gastil, Herman Kahn, William Pfaff, and Edmund Stillman, praises the book's 'adversarial format,' in which the views of the writers are presented separately, in roundtable discussion, and are comparatively analyzed by Kahn, Armbruster, Gastil, and Kahn consider themselves in substantial agreement with the Administration, yet they propose radical changes in our Vietnam policy. That these measures underrate Viet Cong strengths and the political aspects of the struggle in general is not their worst fault. The assertions with which they are proposed (there is much 'room for improvement' in Vietnam and the 'possibilities' for improvement are 'great') ignore the failures of the past 7 years and are inadequate for a policy discussion of today. What must be told the President is not that 'we may yet win,' but the odds (on adoption of policies, implementation, VC and GVN counters, effectiveness), the costs, the time required, and the risks. Only Stillman and Pfaff seriously address themselves to the 'we' in the title question and give needed consideration to American limitations. 7 pp. (CD)

P-3994 Controlling Small Wars. C. Wolf, Jr. December 1968.

A consideration of the theory and conduct of counterinsurgency. Conceptually, the terms 'counterrebellion' (conducted by 'authority' (A) and 'rebellion' (R) are preferred, the latter because it denotes organization, a prime strength of insurgencies. Counterinsurgency differs from other wars not in the primacy of 'politics' over 'force,' but in the types of effective politics and force. Effective politics of counterrebellion require A to demonstrate a growing capacity to govern, by probity, enforcing law and order, and completing announced programs. In terms of force, A's conduct of counterinsurgency requires highly mobile surface forces and airlift and aerial reconnaissance, as well as protracted operation by small units retaining communication links with headquarters. In counterinsurgency, A aims at destroying R's organization rather than annihilating its force and acquiring its territory, as in conventional war. The single most reliable indicator of A's success in counterinsurgency is the rate at which R's middle and upper-level officers are acquired by A, through defection or capture. Improved intelligence and information capability is central to the success of either R or A in insurgency conflict. 16 pp. (CD)

P-4007-2 Multicollinearity and the Astatistical Power of Regression Analysis. J. P. Newhouse. October 1969.

A note on the effect of multicollinearity on the power of regression analysis. (1) In general, collinearity lowers the power of statistical tests of significance in regression analysis. However, if one of two collinear variables is incorrectly dropped, frequently the null hypotheses of no relationship is less likely to be accepted than if the variables had been orthogonal. (2) If only one of two potential explanatory variables actually belongs in the model, the correct one will have: (a) the higher expected t-statistic if two simple regressions are run, each with one of the two variables as an explanatory variable; (b) the higher expected t-statistic if both variables are included. Increasing the degree of collinearity can, however, make the expected values of the t-statistics arbitrarily close. In such a case, sampling error can be a major determinant of which has the higher t-statistic. 7 pp. (AR)

P-4011-1 A Model of Physician Pricing. J. P. Newhouse. February 1969.

A revised discussion of the characteristics of physician care by examination of two alternative econometric models of the market for physician services. The first model is monopolistic, one in which factors of consumer price ignorance or inability to judge quality of product received contribute to the hypothesis that each physician acts as a monopolist toward patients who choose to use him. There is no normal mechanism in this situation for ensuring that price equals average cost in the long run. In the second model, price is set by the intersection of supply and demand curves, as in a competitive market. Admittedly, tests and observations still are small in number, but most accord with *a priori* expectations in indicating that market pricing is monopolistic rather than competitive. Among other findings, studies show that part of the price difference between cities may be due to higher quality care in the higher-priced areas. 20 pp. (KB)

P-4016 A New Approach to Hospital Insurance. J. P. Newhouse, V. D. Taylor. January 1969.

A proposal for a new type of hospital insurance that would re-establish consumer concern with price. Variable Cost Insurance (VCI). Major features of VCI are: (1) The insurance premiums vary directly with the 'expense class' of coverage chosen by the subscriber. (2) In the event of hospitalization, the proportion of the hospital bill covered by insurance varies directly with 'expense class' of the hospital used. In addition to making the consumer an active seeker of economical care, VCI would give hospitals an incentive to be efficient; it can be introduced without substantial prior research; it avoids quality-comparison problems and the bureaucratic complexities of central planning and franchising; and it is adaptable to all types of insurance programs including Medicare and Medicaid. While not a total solution to spiraling hospital costs, VCI appears sufficiently superior to current plans that every effort should be made to introduce it quickly. 12 pp. (MJP)

P-4022 Toward a Theory of Non-Profit Institutions: An Economic Model of a Hospital. J. P. Newhouse. January 1969.

Development and implications of the economic model of a hospital applicable to other nonprofit institutions. The assertion is made that the voluntary hospital with nonprofit status may result in economic inefficiency and cause some misallocation of resources. A bias exists against producing lower quality products in the sense that a profit-maximizing firm would produce such qualities. There is little reason to think that a nonprofit hospital will enter in response to a profitable opportunity (either because the consumer demands are not being satisfied or because inefficient hospitals are providing the product). On the other hand, philanthropy gives the nonprofit hospital some latitude for inefficiency, and this, among other things, tends to forestall entry by profit-making firms. An additional problem exists if the hospital is simply reimbursed by a third party for its costs. By removing the budget constraint, incentives for least-cost production are weakened. 22 pp. (KB)

P-4029 Public Goods and Public Bads: Comments on Mancur Olson's 'The Optimal Institutional Mix.' D. Ellsberg. February 1969.

By reducing the question of the optimal institutional mix to technical problems of efficiency--matters for administration or organizational theory--and by assuming the nature of the 'public good' to be produced by government as 'given,' Mancur Olson abstracts the question from politics. Yet the nature of the good produced cannot be ignored and is an intensely political question. In fact, the production of many public goods also produces 'public bads,' for example the psychological and social impact of police harassment

of ghetto residents in the course of 'maintaining order.' Olson fails to consider methods of reducing the production of specific public bads, a major consideration in conflicts over the optimal institutional mix. 7 pp. (MJP)

P-4036 Some Lessons from Failure in Vietnam. D. Ellsberg. July 1969.

Remarks at a June 1968 conference on lessons and mis-lessons from Vietnam. Our 1965 escalation followed not from a theory of limited war but from the American way of war, reliant on bombing and shelling. The lesson is, a nation that pleads for U.S. military support in a conflict is inviting great destruction of its territory and society. Public revulsion to the Vietnam war is not a result of cyclical change in American attitudes toward war in general, but rather is a response to *this* war: to the way we entered it, the way we are conducting it, and our evident lack of progress or prospect of success. The American bureaucracy must bear substantial responsibility for our failure in Vietnam. Initially there was great ignorance about the society and problems of Vietnam, which the bureaucracy has not corrected. Moreover, we persist in denying and disguising our failures there. This suggests the folly of U.S. intervention in areas and problems of which we know little. It is essential to study the governmental and military learning process to discern its limits and ways to speed it up. 23 pp. (CD)

P-4045 A Systems Analytic Approach to the Employment Problems of Disadvantaged Youth. S. J. Carroll, A. H. Pascal. March 1969.

A discussion of the employment problems of disadvantaged youth and a description of a model of youth employment prospects. Public concern over these problems has spawned a variety of programs, ranging from compensatory education through antidelinquency and anti-dropout, to skill training and job placement programs. Project evaluations and the cost/benefit analyses necessary for the design of effective program packages cannot be conducted until the complex, dynamic interrelationships that underlie youth behavior and opportunities, with all of the manifold feedback loops, are understood. This is a first step in this effort. The conceptual model of the youth employment situation consists of a set of simultaneous equations that predict the economic prospects for an individual on the basis of his experiences, tastes, abilities, perceptions, and opportunities. (Prepared for presentation at a NATO Cost/Benefit Analysis Symposium to be held at The Hague, July 7-11, 1969.) 25 pp. (MJP)

P-4048-1 What New Look in Defense? M. W. Hoag. May 1969.

National security policy in 1969 requires a 'new look' similar to that of 1961 in emphasizing flexible response and in providing guidance for contingencies that American and allied forces can meet, yet with an improved, less abrasive implementing method. To persuade the service bureaucracies to truly consider cost-effectiveness in force planning, the Secretary of Defense might order the Army to redesign its European forces along Soviet lines unless it can produce a more cost-effective design. NATO is inefficient in translating its tremendous resources into relevant fighting capabilities. It is inadequate in conventional capability while possessing vulnerable yet ominous-seeming tactical nuclear weapons. An initial solution is for NATO to align its ground force structure to the more cost-effective Soviet divisional designs. Mutual investments in heavy ABM systems can be avoided by explicit agreements in U.S./Soviet arms control negotiations. To back our nuclear guarantees, we need plans and capabilities for 'light' retaliation. 37 pp. Refs. (See also P-3959.) (CD)

P-4056-1 Population Growth: Investigation of a Hypothesis. T. P. Schultz. August 1969.

An empirical examination of a family planning model built around three factors that are assumed to exert a systematic effect on birth rate: (1) a family-size goal or the number of surviving children that parents want; (2) the death rate, mainly among offspring, which necessitates a compensating adjustment in birth rates to achieve any particular family-size goal; and (3) uncertainty in the family formation process, in which deaths, births, and remarriage are unpredictable. The model also allows examination of the phenomenon of the substantially lower birth rate among urban women when compared with that among rural women. Data from Colombia, supplemented by data from Puerto Rico and Taiwan, give general support to the working hypothesis that variations in reproductive behavior are the outcome of parent behavioral responses to the opportunities and constraints of their environment. The selective expansion of health, education, and welfare programs may do much to encourage parents to seek fewer children. 58 pp. (MJP)

P-4067 The Present Value of the Past. C. Wolf, Jr. April 1969.

An economic model to determine the present value of the past based on three premises: (1) Prior events, somehow aggregated, enter as arguments in the utility function; (2) the process of aggregating prior events can be viewed as mediated through a backward-looking discount rate (decay rate); and (3) the decay rate may be affected by present action. The third premise leads to the corollary that actions taken in the present, which contribute to increases in utility with respect to arguments that have a present or future subscript, may diminish utility with respect to arguments that have a past subscript, and vice versa. Several examples are presented in which the present action is influenced by a desire to protect or preserve a present benefit whose magnitude is often indicated by the scale of prior (i.e., sunk) costs. 13 pp. (MJP)

P-4068-1 Lifetime Earnings and Physicians' Choice of Specialty. F. A. Sloan. December 1969.

A study to determine whether lifetime earnings in various specialties influence physicians' choice of field. Although income payments to practicing physicians in certain specialties felt to be 'shortage' fields may be a politically infeasible policy instrument for influencing specialty choice, increases in residents' salaries could have some appeal for legislators. The effectiveness of both policies is evaluated. Estimates of lifetime earnings differentials between specialties and general practice are presented. The income differentials do not explain why virtually all medical school graduates enter residency programs. However, choices among particular specialties may reflect interspecialty income differences. Regression equations measuring the supply response to income in several specialties are presented. The results indicate that income payments to practicing physicians and stipends to residents would have only a small effect on choice of field. The author suggests other factors that may influence specialty choice: vacancies in a particular specialty, intellectual stimulation, and prestige. 22 pp. Ref. (RG)

P-4069 The Effectiveness of Family Planning in Taiwan: A Proposal for a New Evaluation Methodology. T. P. Schultz. April 1969.

A new approach to evaluating the effectiveness of family planning programs in reducing birth rates. A predictive model incorporates demographic and economic statistics to analyze the relationships between birth rate and various environmental determinants: the number of surviving children that parents want, the death rate for children, and inputs to the family planning program that reduce unwanted births. Examination of the time dimensions of these relations reveals a two- or three-year behavioral-biological lag in determination of birth rates and a similar lag in empirical confirmation of program input variables. Health workers, doctors, and especially village nurses make significant contributions to the success of the program through the dissemination of services and information concerning traditional forms of contraception. 67 pp. Refs. (KB)

P-4075 The Demand for Medical Education--A Study of Medical School Applicant Behavior. F. A. Sloan. April 1969.

An analysis of medical school applicants to provide government planners with policy instruments that may be used to affect production levels of the medical education system. Potential medical students are responsive to recent earnings developments in alternative occupations. Direct medical education cost increases have decreased student interest in medicine, and stipends in Ph.D. fields have lured them away. The government should reappraise its loan and scholarship policies, as well as its manpower objectives in the scientific fields in which its control can influence earnings. The public sector may stimulate demand for medical education by implementing policies, such as health insurance schemes that effect a rise in physician earnings. It is also possible that the supply of medical education has a positive impact on the demand. 40 pp. Refs. (EB)

P-4079 New Departures in Social Services. A. H. Pascal. April 1969.

Broadly defined, social services are those noncash resources made available under public auspices or as a result of public financing for the furtherance of society's goals. These goals are the protection of incompetents, the improvement of consumer choice, the enhancement of social functioning, the advance of equal opportunity, and the establishment of minimum material adequacy. Once the political process has generated decisions on the resource commitments and the programs that fall under each objective, the institutional arrangement for furthering the goal can be selected from among the four types: government contractor, individual benefits, and cash transfers. Individual benefits and cash transfers have substantial advantages over the

first two methods in preserving free choice and in maintaining economic efficiency. However, since the individualized benefit approach would be a radical departure in many areas, such as education, a series of demonstrations of the system should be conducted before any large-scale implementation. 12 pp. (MJP)

P-4080-1 The Economics of Moral Hazard: Further Comment. J. P. Newhouse, V. D. Taylor. August 1969.

A commentary on an article in the June 1968 *American Economic Review* pointing out that medical insurance reduces medical care price below marginal cost and thus acts as a subsidy. Hospital insurance has contributed to the overall inflation in medical costs by making the consumer responsible for only a small portion of the cost differences between hospitals, thus encouraging him to opt for more expensive care. A remedy would be to provide Variable Cost Insurance (VCI) that pays a hospitalized individual a lump sum of a pre-determined quality level, which may be applied either to more or less expensive care. Insurance subsidization of the quantity of hospital services provided would still exist, but by removing the distortion in the consumer's choice of a hospital, VCI could importantly reduce the escalation of hospital costs. This scheme is relevant to the current policy debate over medicare and medicaid. 11 pp. (EB)

P-4087 Priorities in Funding Health Research. V. D. Taylor. May 1969.

Improved methods of delivering medical and dental care will have little effect until doctors and hospitals are motivated to adopt them. The most important research task is to find levers to change the system. Among the needs is an institutional framework in which nonprofit hospitals become concerned with efficiency. Consumers need tools for evaluating the service they receive, and motivation to avoid extravagance. The medical insurance system should reward quality and efficiency. The licensing system should be changed to eliminate restrictions that serve mainly to keep needed health personnel scarce. 9 pp. (MW)

P-4090 The Price of Hospital Care. V. D. Taylor. May 1969.

Derivation and application of a new hospital price index constructed for the National Advisory Commission on Health Manpower. Based on a weighted average of the prices of the factors used as inputs in producing hospital care, it distinguishes the effects of price inflation from the progressive increase in the amount of labor and supplies consumed per patient-day. Of the 92 percent rise in costs per patient-day during 1955-1965, only 37 percent was due to price increases. Since 1966, doctors and hospitals have been progressively slowing down the increase in resource inputs (the difference between price increase and cost increase) -- a fact completely obscured by the normally cited indicators of hospital cost. 6 pp. (MW)

P-4107 Statement on 'The Military Budget and National Economic Priorities.' M. W. Hoag. June 1969.

Text of a statement to the Subcommittee on Economy in Government, Joint Economic Committee, June 5, 1969, in which current policies on military spending are reviewed, and a method of increasing cost effectiveness in military budgeting is proposed. Instead of drastically reducing U.S. troops in Europe, an effort should be made to increase NATO cost effectiveness. In contrast to the Warsaw Pact, U.S. Army divisions assigned to NATO are costly and too few. The situation might be rectified were the Army ordered to adopt the Soviet model within a specified time limit or, alternatively, to submit a better plan for NATO ground force redesign. Such action in all U.S. services might result in economies in the best possible way, since planning professionals would be given the strongest incentives to reduce costs without impairing capabilities. Every means to obtain greater cost-effectiveness should be examined before the U.S. retreats from its commitments or its policies of flexible response. 8 pp. (EB)

P-4113 Effects of Graft on Economic Development: An Examination of Propositions from the Literature. R. E. Park. June 1969.

An examination of the effects of graft, i.e., the misuse of public office for private ends, on economic development. Graft does not necessarily retard development. Moreover, it is not a homogeneous phenomenon: there are numerous types, both collusive and noncollusive, with direct, indirect, and monetary effects. Also, the impact of any particular act depends on the institutional, economic, and social environment. A simple disaggregative method of analyzing graft-effect hypotheses is proposed, and then applied to several hypotheses. This approach emphasizes the inhomogeneity of graft

by considering separately the effects of each type. Indirect effects, though perhaps important, are not considered. Nor is empirical evidence presented, though potential empirical studies and methods of measuring graft are discussed. 37 pp. Refs. (LC)

P-4114 The Air Force and Operations Research: A Commentary on J. B. Holley's Paper. R. L. Perry. August 1969.

A commentary on the paper 'Operations Research and the Air Force: A Case History in Doctrine and Organization, 1942-1968,' an analysis of the USAF's failure to fully exploit operations research (OR). Holley avoided certain harsh judgments implicit in his critique. OR finds ways to perform military tasks more effectively and efficiently by evaluating the operational performance of equipment and weapons, and by analyzing the relationship between tactics and weaponry. Two logical extensions--prediction of the course of future tactical and strategic operations, and assessment of organizations' operating efficiency--would involve large policy issues, e.g., weapons choice, strategic doctrine, and research and development procedures. However, USAF OR has addressed only small, quantifiable issues--e.g., bombing accuracy, gunnery practices, and maintenance, supply, and inventory problems--and has protected the status quo by generating evidence to counter analyses performed by non-USAF groups. 16 pp. (LC)

P-4116-1 A Simple Hypothesis of Income Distribution. J. P. Newhouse. January 1970.

A discussion of a model for predicting income distribution across states. The basic assumption is a constant industry wage structure and level across areas; therefore, the amount of human capital is a function of the industry mix in a given area. Variables such as discrimination, education and training, labor supply, and property income were not considered to be of significant influence. The model is tested using data from 51 states and the District of Columbia. The results are analyzed using canonical correlation. This indicates that the basic hypothesis serves very well in predicting income distribution across states and that factors other than industry mix are either not important in determining the shape of the income distribution or are correlated with industry mix in the sample. 26 pp. (MJP)

P-4126 A Model of Long Delays at Busy Airports. A. Carlin, R. E. Park. August 1969.

A simple, deterministic queuing model of airport congestion delay costs, and a JOSS program employing it to evaluate airport policy changes. (The AIL and other airport capacity studies have usually used a steady-state queuing model that is misleading or inapplicable when arrival rates become close to or greater than service rates.) This new model takes account of the pattern of arrivals/departures, delay patterns, weather (good/bad), and season (summer/winter). Analysis of about 32,000 flights at Kennedy International shows a total delay cost during 1967-1968 of \$25 million; average traffic peaked at 4 to 6 p.m. and peak average delays occurred 2 hours later. Results are given for applying the model to evaluate lessened delay from reducing traffic by various means. 35 pp. Refs. (MW)

P-4134 Marginal Cost Pricing of Airport Runway Capacity. A. Carlin, R. E. Park. August 1969.

An examination of the costs of congestion delay at La Guardia Airport, New York, and possible changes in fees to reduce them. At present, each additional airliner arriving or departing between 3 and 4 p.m. imposes an average of \$1000 in delay costs on other users, and one more non-airline plane costs others more than \$500. Full marginal cost pricing, imposing congestion tolls, is probably infeasible, in part because airline lessees must agree to any change to the present weight-based fees. Therefore, a proportional marginal cost pricing system is proposed that would not raise total airline costs but would tend to discourage low-value general aviation at peak hours. Administrative measures to encourage efficiency would still be needed. 28 pp. Refs. (MW)

P-4135 Soviet Growth, Resource Allocation, and Military Outlays. A. S. Becker. June 1969.

This statement before a Congressional subcommittee is addressed to the Soviet economic capability to accomplish its military objectives. The peacetime growth rate of aggregate output has been notably rapid, but it seems unlikely that it can be raised much above the level achieved in recent years. Nor should the possibility of a decline be ruled out, if attempts at patchwork repairs to the economic mechanism prove unsuccessful. But the USSR is rich

in physical and human resources, and muddling through may still carry it a long way. The ceiling has apparently been reached on the rate of investment attainable under the present arrangement, and relative stability also characterizes the shares of the major sectors of consumption and defense. This does not mean that the Soviet Union will not be able to maintain its strong and growing military machine. Given growth increments at least as large as those obtained in recent years, it should be able to continue building up the forces to help meet national objectives. 10 pp. (CD)

P-4153 Congestion Tolls for Regulated Common Carriers. R. E. Park. September 1969.

Discussion of the role of congestion tolls to increase the efficiency of use of commercial airports, in terms of a simple model of air transportation. In contrast to previous discussions, users and producers of transportation service (passengers and airlines) are explicitly distinguished. In the first version of the model, ticket prices are assumed--unrealistically--to be flexible and competitively determined; then perfect optimality is attainable by imposing an appropriate toll either on airlines or on passengers. In the more realistic second version of the model, ticket price is fixed above the competitive level. In the absence of a toll, there are two inefficiencies: The level of transportation is non-optimal, and it is produced inefficiently, using partially loaded airplanes. An appropriate toll on airlines can do much to correct both of these inefficiencies, and is always superior to the best toll on passengers. 23 pp. (See also P-4134.) (Author)

P-4177 Military-Industrial Complexities. C. Wolf, Jr. September 1969.

Examination of the military-industrial complex (MIC) controversy. The MIC is more heterogeneous and divided than extremists suppose; the defense sector employs more budgetary controls than do other sectors spending enormous governmental resource allocations. These other industrial complexes (OIC) should also be examined. The extent to which we buy defense above our 'needs' depends on our response to three variables: the estimate of the threat, the social-opportunity benefits foregone, and the efficiency of the defense production services. Several characteristics of the MIC invite criticism: its secrecy, complexity, and the absence of opposition prevent outsiders from judging its worth; its self-perpetuating nature, the appeal to patriotism, the scale of defense spending, and institutional rigidity all contribute to the mis-estimation felt to exist in defense spending. None of these characteristics applies solely to the MIC; all are present in OICs such as health and education. 16 pp. (SM)

P-4183 Hospital Demand for Residents--Some Preliminary Results and Suggestions for Further Research. F. A. Sloan. August 1969.

Formulation of a mathematical model to investigate the demand for residents by hospitals. A study of published data of 99 departments of ophthalmology yielded information about the educational function of a hospital and that of a nonprofit institution. In general, stipends in internal medicine, obstetrics-gynecology, and ophthalmology are almost identical, but those in psychiatry are higher. A mathematical equation is constructed that considers four independent variables which act on the number of residencies offered by the hospital: stipends, affiliation, average daily census, and outpatient visits. Empirical results of the model indicate that public support of resident salaries would have substantial impact on the number of residents demanded by hospitals, since hospital residency programs expand in response to demand pressures. In a larger context, the equation seems to confirm a belief that the location of residency is a factor in determining the location of physicians' practices. 8 pp. (EB)

P-4184 CAAC--The Airline of Communist China. H. Porch. September 1969.

Of all state-owned airlines, few seem as intriguing as CAAC, the one belonging to Communist China. It seems strange to find a country the size of China with nuclear technology in one hand and a near-obsolete airline in the other. The current status of civil aviation in Mainland China is adequate but not a competitor to other airlines. CAAC handles the scheduled airline and all nonscheduled service, such as cropdusting, fire patrols, flying ambulance, and freight flights to remote areas. Aviation was not restored to Mainland China until 1950, and then only with Soviet assistance. Since 1961, CAAC has 'gone it alone,' but progress has been slow, primarily because of a lack of long-range equipment. Although CAAC was taken over by the military in 1966 it seems to be operated as it was under civil control, although the author speculates that it may now be the transport arm of the military. (Prepared for presentation at the Sixth Annual Meeting of the American

Institute of Aeronautics and Astronautics, Anaheim, Ca., October 10, 1969 and for reprint in the *Journal of the American Aviation Historical Society*. 19 pp. Refs. (Author)

P-4193-1 Agricultural Policies and Performance. K. C. Yeh. March 1970.

An overview of Communist China's agricultural policies during the period of 1949-1968 and their impact on production and economic growth. During the land reform and First Five Year Plan, collectivization was accomplished. In the Great Leap of 1958-59, the Peoples' Communes were formed, being mergers of cooperatives combining industry, agriculture, trade, education, and military affairs under one central control. These communes averaged over 4000 households. The subsequent crisis, recovery, and Cultural Revolution in 1960-1968 leaves agricultural performance still at critical levels, as well as a greatly increased population, heavy expenses for nuclear defense development, and tensions along the Sino-Soviet border requiring a high troop level. The breakthrough needed in agricultural production will depend on the use of chemical fertilizers, increased agricultural investment, and, particularly, the employment of an incentive system. Intensification of revisionist policies (capitalistic incentives) will provide Maoists with their best chance of success. 78 pp. Bibliog. (AR)

P-4201 Superpower Strategic Postures for a Multipolar World. M. W. Hoag. October 1969.

A consideration of what arms limits upon the United States and the Soviet Union are desirable. That a ban upon both MIRV and ABM systems would stabilize the bipolar strategic balance, and slow nuclear proliferation, is disputed. A MIRV ban would encourage thick ABM defenses of cities, and could easily be evaded by the Soviets. Expected superpower postures with MIRV and thin ABM systems will, with low-cost marginal adjustments for protection against 'nth' powers, markedly increase the costs of acquiring retaliatory capabilities against a superpower. Many nations will use such arming rather than disarming by the superpowers ('vertical proliferation') as an excuse for not signing the Non-Proliferation Treaty. But the number of nuclear powers should expand no faster, while the ambitions of 'nth' country strategic programs should expand more slowly. 26 pp. (Author)

P-4206 The Relationship of Corrected R^2 and Incremental T-Statistics. J. P. Newhouse. October 1969.

The use of corrected R squared in incremental t-statistics as a criterion for stopping a stepwise regression program is questioned. This note argues that such use is equivalent to including those variables whose incremental t-statistic is greater than one in absolute value; that is, including variables whose estimated coefficient exceeds the estimated standard error in absolute value. Thus there appears little or no need for regression packages to output corrected R squared. It is also stated that uncorrected R squared is a better estimator of the population squared multiple correlation coefficient. 4 pp. (AR)

P-4222 Economic Analysis in Governmental Decisionmaking. W. E. Hoehn, Jr. October 1969.

A discussion of the practical aspects of economic analysis, using as examples of Bureau of Reclamation Water Resources projects. Issues raised are: the role of interest or discount rates, the determination of economic lifetime, the assessment of nonquantifiable factors, the problem of real alternatives and the role of analysis in identifying critical parameters. The majority of water resources projects have shown less than satisfactory results; the fault lies in the rules specifying interest rates, payment periods, method of calculating benefits and costs and method of determining benefits to be included. The problems of economic analysis arise primarily from ingrained agency optimism, reliance on assumptions from prior studies, incomplete guidance from decisionmakers, and codified rules for analysis that becomes less relevant with time. Economic analysis does not guarantee that decisionmaking will be easier; it is hoped that it provides better information on the effects of resource allocations decisions, to provide a better basis for decisionmaking in general. 22 pp. (AR)

P-4223-1 National Income Accounting in the USSR. A. S. Becker. June 1970.

An attempt to determine and evaluate the method used in constructing the official USSR national income and product accounts. No Soviet national accounts manual has been available for over 30 years. Marxist distinctions

between productive and nonproductive labor, between material product and services, always difficult, are growing ever blurrier. Cleaning and dyeing, once service, is now industry. Material production now includes some of the fastgrowing R&D activity and may come to include all R&D, increasing the growth rate. There is even agitation for classing all consumer service activities as a branch of production. In general, the author's statistical tests lead him to conclude that official Soviet national income data are more reliable than 20 years ago. Some doubts remain, however, because of Soviet secrecy and lack of hard data on incomes, output by branch and by type of use, etc. 70 pp. Ref. (MW)

P-4234 The Analysis of Residential Segregation. A. H. Pascal. October 1969.

A review of residential segregation. Dealing mainly with black Americans' housing, this Paper considers (1) why segregation is an important topic; (2) the current magnitude of segregation in American cities and recent trends; (3) theoretical, empirical, and policy issues; (4) a new model of housing segregation. Attitudinal segregation is enforced by white racism, abetted by black racism and class prejudice. A rudimentary model of residential choice is discussed that can aid in explaining how segregation originates, since it incorporates a racism variable. There is a lack of knowledge about the effects of segregation on other social phenomena as well, which compounds the problem of policymaking. Various public policies should be analyzed to determine their relative merits in achieving housing integration, and more fundamental analysis should be undertaken to determine how and why segregation exists and what its social impacts are. Until then, little can be accomplished in healing the breach between the two societies, black and white. 54 pp. Refs. (EB)

P-4237 The Implications of Geographic Specificity for Air Pollution Abatement Strategy. A. Carlin. October 1969.

A review of a presentation by R. E. Kohn at the Symposium on the Development of Air Quality Standards in Los Angeles in October 1969. Professor Kohn's discussion of air pollution abatement strategy could be expanded by considering an additional strategy wherein each pollution control authority determines which air quality standards are exceeded, establishes progressively smaller annual limits for the emission of corresponding pollutants by specified categories of emitters until the desired air standards are met, and then auctions off permits corresponding to these limits. This approach appears to offer significant advantages over either strategy discussed by Kohn, if the assumption of the geographic-specificity problem (that emissions from all sources, regardless of their location in the airshed, have equal effect on air quality at a receptor point) is ignored. If considered, then restricted auctions with minimum bids equal to the computed emission charges for each district and emission limit would appear optimum. 6 pp. (EB)

P-4239 Transportation and Efficient Growth. R. E. Park. November 1969.

This Paper discusses efficient growth in a series of models that explicitly incorporate spatial separation and costly transportation. All of the models are based on linear technologies of von Neumann type. Aspects of efficient behavior are explored in each of the models. The central results of the Paper concern the way in which efficient frontiers evolve over time and the nature of efficient growth paths. 141 pp. Refs. (Author)

P-4243 Policy Analysis in International Affairs. H. S. Rowen, A. P. Williams, Jr. November 1969.

The role of systematic analysis in increasing the quality of choices open to decisionmakers at policy levels in international affairs is explored. Discussion includes key organizational features of an analytical apparatus applicable directly to the Department of State. While reliance on the intuitive operator is characteristic of much activity in the foreign affairs community, it is suggested that establishment of a foreign affairs system could provide deeper knowledge, more data, and a more systematic evaluation of objectives and alternatives than nonmilitary programs and policies often get. At present, no countervailing system of the analytic competency of the PPBS approach adopted by DOD in the 1960s exists to represent nonmilitary interests, partly because the systems approach may be wrongly regarded as synonymous only with quantification and computer technology. 54 pp. (TC)

P-4244 Management, Productivity, and Growth. C. Wolf, Jr. November 1969.

A Paper presented to the Top Management Symposium of the Asian Productivity Organization on the process of accelerated economic growth. Increases in total factor productivity and a vigorous market mechanism are essential characteristics of rapid growth in developed as well as less-developed countries. The role of top management--innovating and guiding potential sources of increased productivity--is vital in this process, suggesting that attention be given to a number of priority issues. Among them: applications of improved analytical and decisionmaking techniques, appropriate use of new computerized information systems, optimization of R&D expenditures by drawing on the available pool of technical knowledge, especially in less-developed countries, increasing efficiency through acquisition and merger, and exploration of advantages of economic cooperation and regionalism. 17 pp. (TC)

P-4253 Effectiveness of Family Planning in Taiwan: A Methodology for Program Evaluation. I. P. Schultz. November 1969.

This paper proposes a method for answering the question: For a given level of effort, which of the many alternative family planning programs appears preferable? The approach here is to develop a predictive model of human fertility, from which one may statistically infer from cross-sectional associations the effectiveness of family planning programs. The author presents some tentative statistical evidence on the association between regional birth rates and family planning program activity in Taiwan to illustrate a different approach in evaluating program effectiveness. The overall effects of the program as well as the mix of personnel are evaluated in terms of cost-effectiveness. This study confirms the central importance of a behavioral model, even where this model can only take account of a few of the characteristics of the parents' environment which might be responsible for differences in desired birth rates. 73 pp. Refs. (RG)

P-4266 Incentive Effects of Some Pure and Mixed Transfer Systems. M. C. Barth, D. H. Greenberg. December 1969.

An attempt to demonstrate that a wage subsidy (WS), when combined with some other income maintenance program, may have just as adverse an impact upon work incentives as a negative income tax (NIT). An analysis is presented which concentrates on a mixed wage subsidy-public assistance program compared with an NIT. A 'pure' WS (not augmented by other forms of income maintenance) is also compared with an NIT. The static incentive effects of the three alternative programs, in the form of substitution effects and income effects, are compared. Except for a few extraordinary families, a pure WS appears to be less leisure-inducing than an NIT. But when the WS is supplemented by other forms of income maintenance, such as public assistance, its relative advantage may be neutralized. While it is very possible that an applied WS would be superior in its incentive effects to an NIT, it need not be. 30 pp. (RG)

P-4267-1 Interrelationships between Procreation and Other Family Decisionmaking. A. J. Harman. March 1970.

Discusses the determinants of and interrelationships between fertility and four other factors that affect family size--employment, income, length of marriage, and migration. A model is developed characterizing relevant behavior of individual families. Fertility (a process of first reaching a family size goal and then maintaining that level) is analyzed empirically using a formulation based on the model derived from data for the Republic of the Philippines. The goal is related to alternative uses of the wife's time--child rearing or labor force participation--as well as the parents' education. Both employment of the wife and education affect fertility negatively. Population control requires both eliminating unwanted births and reducing the number of desired births. The most cost-effective strategy for curtailing the population growth rate should include not only direct control policies, but also programs not directly aimed at population reduction, such as increased education for the female. 34 pp. (LC)

P-4274-1 Medical Costs, Health Insurance, and Public Policy. J. P. Newhouse, V. D. Taylor. March 1970.

Spiraling medical costs are partly the result of price subsidy health insurance plans that prompt neither hospitals nor the insured to economize. Most regulatory approaches don't directly address the problem. A new kind of insurance might. The authors propose variable cost insurance (VCI). Under its terms, applicable to all types of health insurance, hospitals would be rated

according to their expensiveness and a portion of costs, reflected in variable premium plans, would be passed on to subscribers. Many might still choose more costly (which may often be only more 'luxurious' or wasteful) treatment. But economy-minded patients and their physicians would use more efficient hospitals, in turn providing rewards for good management. Expected results: a slowdown in the hospital cost spiral and the return of the consumer as a force in the market place. 38 pp. (TC)

P-4275 On the Postattack Viability of American Institutions. W. M. Brown. January 1970.

This paper attempts to: (1) delineate a set of crucial problems which could develop if a nuclear war collapsed the federal government as an authoritative presence; and (2) discuss some that might be insurmountable even if the federal government survived. The first set represents the threat to viability from the dependence on the suddenly missing presence of the federal government; the second because the government would not be skilled at its vital postattack functions. The author concludes that: (1) The problems of the early survival period and the reorganization period may be intangible ones rather than ones involving shortages of material sources. (2) If the federal authority disappeared after a nuclear attack, reconstituting it could be very difficult. (3) An alternative approach to postattack federal functions is needed to provide a desirable orientation for postattack planning. (4) Some countermeasures are possible that might be implemented in a future crisis if planned for in peacetime. 29 pp. Ref. (RG)

P-4281 Political and Strategic Relations (Australia-New Zealand-United States): The View from Washington. M. W. Hoag. January 1970.

An assessment of ANZUS relations to be presented to a conference on this theme at the Australian National University, Canberra, Australia, February 1970. Current relations are unusually good, but will be subjected to new strains in determining a revised counter-balance in Asia to a nuclear China. From a strategic assessment of this threat, idealized criteria for a counter-balance in the Pacific are determined. These criteria stress discriminating capabilities for controlled 'city-sparing' nuclear responses. Conflicting proposals for national nuclear forces in Asia (H. Bull, A. Buchan) are opposed. 32 pp. (Author)

P-4284 Prices and the Guideposts: The Effects of Government Persuasion on Individual Prices. A. J. Alexander. January 1970.

A brief discussion of the government's economic policy during the period 1962-68 and the influence exerted on the pricing behavior of firms. From 1962 until the close of the Johnson Administration in 1968, a number of wage-price guideposts were established to moderate the rate of inflation; during this time, attempts were made to influence the pricing decisions of firms through a series of public and private confrontations. This paper describes the policy of confrontation, proposes alternative hypotheses to explain the resultant behavior of firms, and analyzes statistically those variables predicted to be associated with government success and failure in influencing firm behavior. Detailed analysis of the period from October 1965 to June 1967 suggests a number of variables related to government effectiveness in restraining price increases, including market power, markup, vulnerability, level of public and private confrontations, advertising, and strength of demand. 31 pp. Bibliog. (KB)

P-4286 Libraries and the Other Triangle under the Demand Curve. J. P. Newhouse. January 1970.

A theory of library services is developed to aid libraries in deciding which books they should buy. They should buy those books whose appropriately discounted benefit stream over the life of the book is greatest, where benefit in any period can be approximately measured by the area under the demand curve. For one thing, the theory predicts when demand for a library book will fall, e.g., when a paperback edition is issued. Although developed in the context of library services, the theory appears applicable to a number of publicly provided services which are substitutes, or near substitutes, for privately marketed goods. In effect, it uses part of the area under the demand curve for the private good to approximate the area under the (presumably measurable) demand curve for the public good--thereby helping make public sector resource allocation more rational. 10 pp. (TC)

P-4287 Technological Advance and Market Structure in Domestic Telecommunications. L. L. Johnson. January 1970.

As new telecommunication developments (such as satellite relay of TV

broadcasts) offer competition to established carriers, existing rates must not be frozen to protect uneconomic activities. 'Cream skimming' could affect only 15 percent of Bell System activities. The boundary between the franchised monopoly and the competitive area might reasonably be drawn between switched (telephone) and unswitched systems, as proposed by the President's Task Force on Communications Policy. Competitors must be allowed to interconnect with telephone lines. Revamping of radio spectrum management practices for efficient use is increasingly needed. The vast difference in volume between international and domestic message traffic (millions compared with billions) may suffice to justify quite different market structures for them. (Delivered at the American Economics Association annual meeting, 1969.) 13 pp. Ref. (MW)

P-4291 Top Management in Egypt: Its Structure, Quality, and Problems. S. Farid. January 1970.

Under 'Arab Socialism,' Egyptian enterprises are run by all-employee boards of directors, 5 appointed from top management by the President of the Republic, with the chief executive as chairman, and 4 elected by the labor force. The former are highly educated and well versed in Western management principles; the latter are not and tend to act as labor representatives rather than company directors. Formal pre-candidacy training at management institutes should be provided for potential electees, who should have at least secondary schooling. The Government should give elected directors the same 'representation allowance' it now gives all top managers to help them maintain a dignified image, and the 2-year elective term should be lengthened. Nonadherence to contractual agreements by state enterprises could be eliminated by realistic, flexible central planning and sound pricing policies. Control over state enterprises--now shared by the Arab Socialist Union and three government agencies--should be restricted to the responsible Government corporation, and the latter should perform R&D for the enterprises it controls. 67 pp. Ref. (MW)

P-4295 Black Gold and Black Capitalism: A Shortcut for Negroes into the Economic Mainstream. A. H. Pascal. January 1970.

The Italian produce merchant, Polish steelworker and the Irish cop are American clichés today, but the original establishment of industrial enclaves by ethnic minorities did serve a purpose: it provided a foothold for launching them into the mainstream of the American economy and ultimately into viable positions in the society. In this paper it is argued that establishment of similar semi-monopolies for newly emerging minorities--chiefly Blacks--could do the same. What's needed is a field where opportunity is high, investment is low, training time is short, profits are substantial, and entrepreneurship is virtually assured. The answer: gasoline dealerships. There 220,000 in the U.S., generating \$25 billion in annual sales and with an annual payroll of \$2 billion. For openers, a federal investment of \$1 billion would result in 100,000 black-owned and black-operated service stations. Concludes the author: it is a practical proposal with incentives and advantages few others offer. 20 pp. (TC)

P-4312 Does an Increase in the Price of a Necessity Reduce Welfare more than an Equivalent Increase in the Price of a Luxury? J. P. Newhouse. February 1970.

This paper develops an argument to suggest that the price increase that causes the greater decrease in welfare is independent of which good is a 'necessity,' if necessity is interpreted as low-income or low-price elasticity. A simple two-commodity model expresses utility as a function of medical care and a composite bundle of other goods. Conclusions that hold for the model are assumed to apply to a multicommodity world. An illustration shows the proportion of a city worker's family budget for a moderate living standard allocated to various commodities in 1966. According to this index, shelter, food, and medical care price increases cause a noticeably greater decrease in welfare than other commodity groups. Thus, there may be some reason for

concern over recent behavior of medical care prices, but the reason is not that medical care is a 'necessity.' 8 pp. (KB)

P-4317 Employing the Training Program Enrollee: An Analysis of Employer Personnel Records. D. H. Greenberg. March 1970.

Data for the evaluation of training programs is usually collected directly from former trainees. To explore a less costly, alternative approach, follow-up data was collected from the personnel files of 16 employers of the graduates of 4 Los Angeles training programs. While limited in some ways, these data did permit a comparison of the training programs and did yield some insight into the firm's influence on the post-training experience. The trainees associated with on-the-job training, for example, seem to have been more successful than the graduates of the 3 institutional programs with whom they were compared. Much of the former program's superiority can apparently be traced to a greater ability to place trainees at firms where success is more probable. Within the Los Angeles area, success seems to be most probable at large government contractors and least probable at small companies in highly competitive industries. 27 pp. (Author)

P-4323 Two Dialogues on Defense Relationships between the United States and Japan (with Some Program Notes). O. Gass. October 1969.

Of the opinion that the present (1969) defense relationship between the U.S. and Japan is not only worthless but even counterproductive, the author resorts to the use of dialogue as a means of exposing the essence of the U.S.-Japan complex through a confrontation of outlooks expressed in speaking parts. The differing views of the American and Japanese governments are revealed as opinions exchanged on three defense issues: the return of Okinawa, the withdrawal of all U.S. military installations from the principal home islands of Japan, and the continuation of the Japan-U.S. security treaty. Of particular interest is Japan's desire to abstain from commitments that could involve her in 'distant political objectives,' her assessment of the roles of the USSR and China in Asia, and her reluctance to assume an enlarged responsibility for the stability and security of east Asia during the 1970s. 72 pp. (DGS)

P-4386 *The Chinese Economy under Communism*, by Nai-Ruenn Chen and Walter Galenson: A Book Review. K. C. Yeh. June 1970.

K. C. Yeh praises *The Chinese Economy under Communism* as an excellent summary and evaluation--with important original contributions to literature in the field--concerning Communist China's development policies and performance in the 16 years since the Communist takeover in 1949. Summing up, Yeh writes: 'This reviewer recommends this book highly to intelligent laymen who seek a balanced view of economic development in Communist China.... Specialists will find it stimulating both as a case study in economic development and as a useful summary of the current state of knowledge about the Chinese economy.' 4 pp. (TC)

P-4387 Promoting the 'D' in R&D: Dubious Models and Relevant Strategies. H. Heymann, Jr. May 1970.

Sophisticated R&D techniques and approaches of advanced countries have little practical utility for developing countries like Turkey. This paper addresses the difficult task of finding an R&D strategy that has some genuine relevance to Turkey. What is proposed relies more on concentration and selectivity than on comprehensive reform. It stresses the importance of focusing on key problem areas, building 'islands of excellence,' and selecting carefully the institutional arrangements through which foreign expertise is linked to the indigenous development effort. Four illustrative examples are cited of novel institutional approaches, drawn from different fields, that appear to be both propitious for this task and appropriate to the Turkish scene: (1) in agriculture--the adaptation-diffusion institute; (2) in manufacturing--the multinational co-production framework; (3) in data processing--the cooperative service bureau; and (4) in governmental decisionmaking--the public policy analysis group. 34 pp. (Author)

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