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INDICES TOWARD MEASUREMENT OF THE GLOBAL ENVIRONMENT.(U)

FEB 73 P MOBLEY, D MCCORMICK, K TIDWELL

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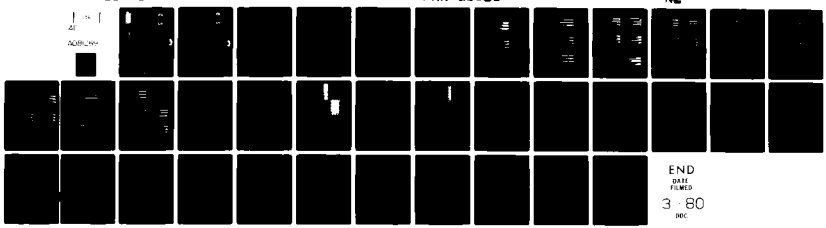

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PREFACE

This contract was undertaken for the Office of External Research, Department of State. The work in this study was done in February 1973. The research was primarily conducted by Peggy Mobley, David McCormick and Karen Tidwell.

The findings contained herein are those of the Contractor and do not necessarily represent the views of the State Department or any other agency of the United States Government.

Franz J. Mogdis, Manager
Applied Science & Technology Dept.
Bendix Aerospace Systems Division

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I. INTRODUCTION

This project was undertaken as a pilot effort to examine indicators of global and United States' economic, social and political progress over time. The study describes the major trends in these three areas via the use of selected indicators from 1960 to 1970.

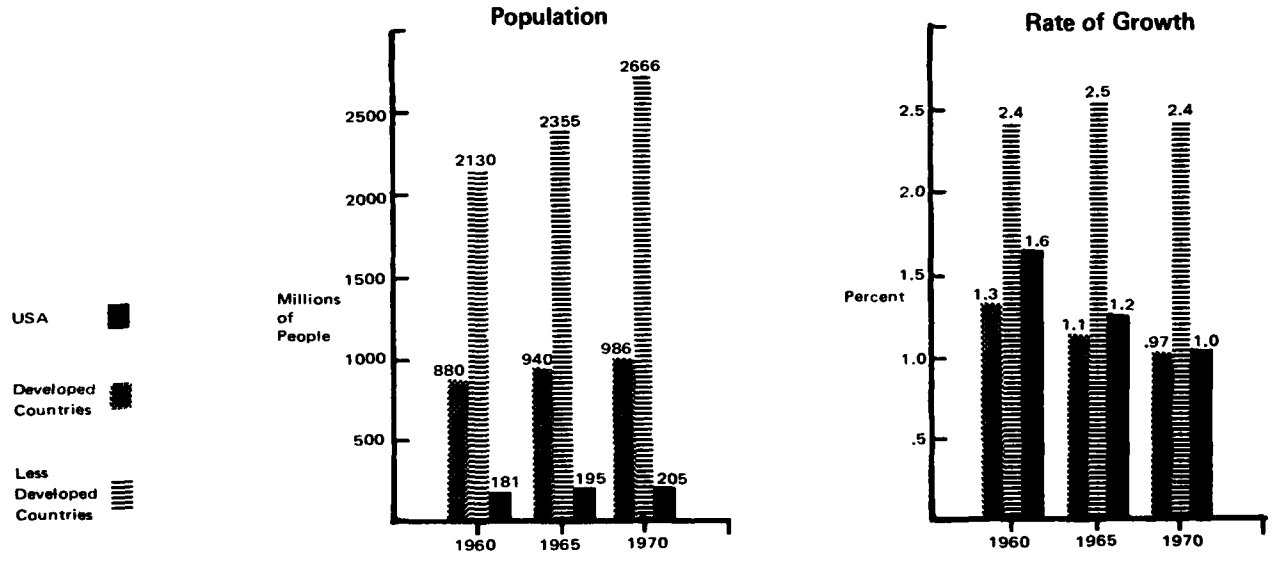
For the purpose of this report the world environment is described by four categories of variables: Population, Living Standards, Interdependence, and War and Peace. Thirty-four variables were selected from data collection on the basis of two criteria: 1) representativeness of the above categories and 2) interest to decisionmakers.

Aggregate data were collected for each variable for three time points: 1960, 1965 and 1970. It is, of course, desirable to collect a continuous timeseries of data but because of the limited time and scope of the project, this was not possible. However, the time points selected should be adequate in demonstrating the utility of the general approach.

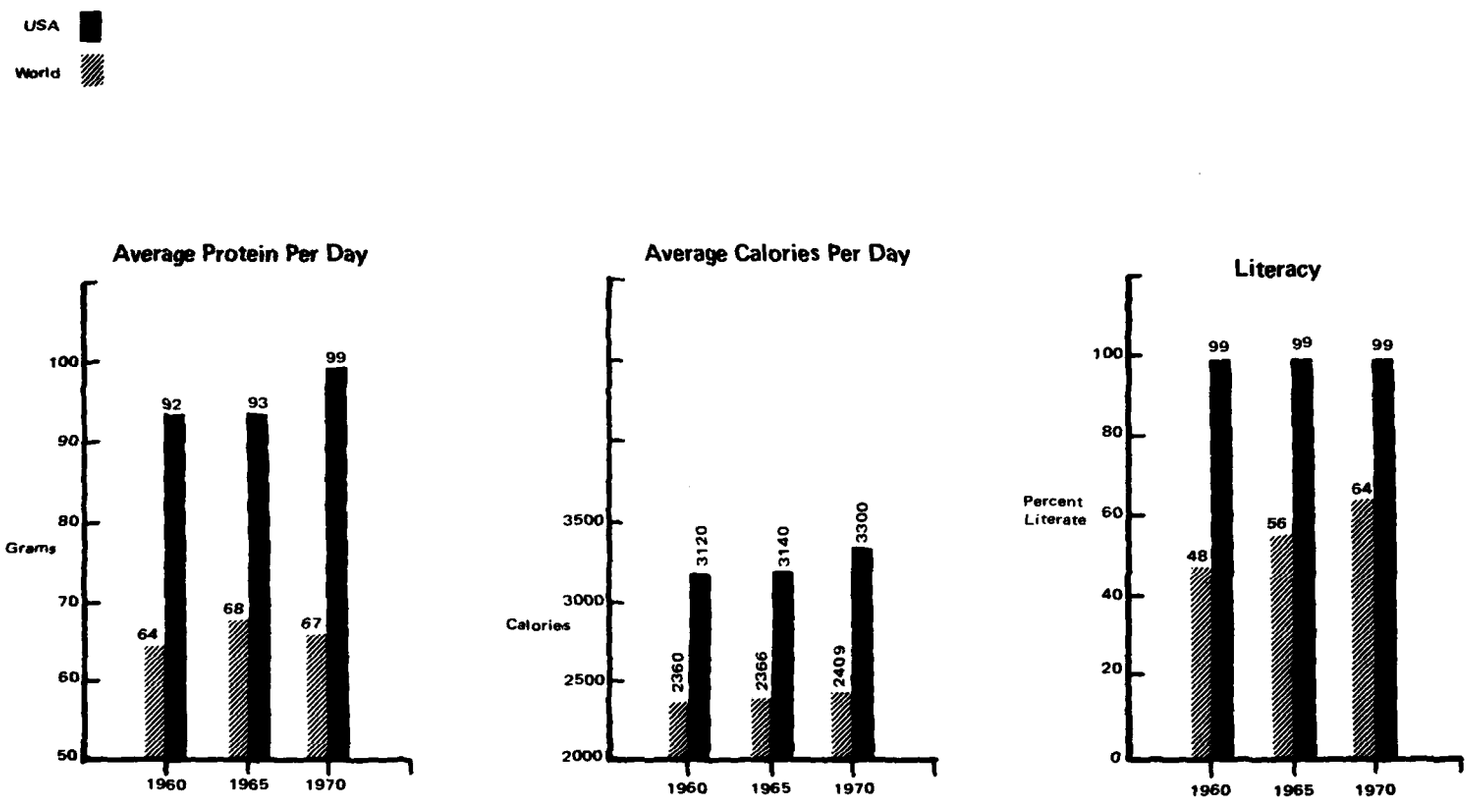
Since the primary concern of the study is to examine the change in the world environment and in the United States over time, the data collected are presented in world totals and in United States totals.

Section II of this report displays the variables in bar diagrams; Section III presents the actual compilations in a series of tables. Section IV presents the definitions, measurements and sources of the variables.

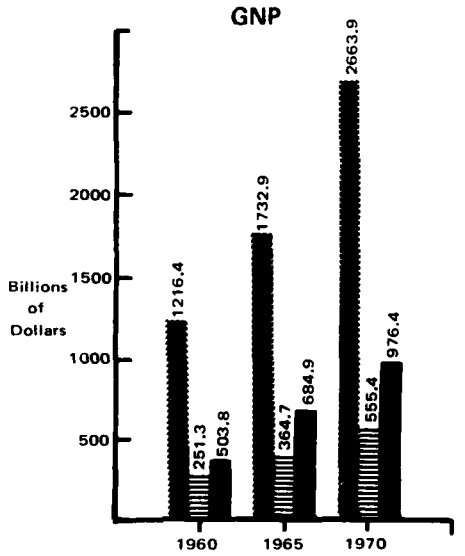
POPULATION

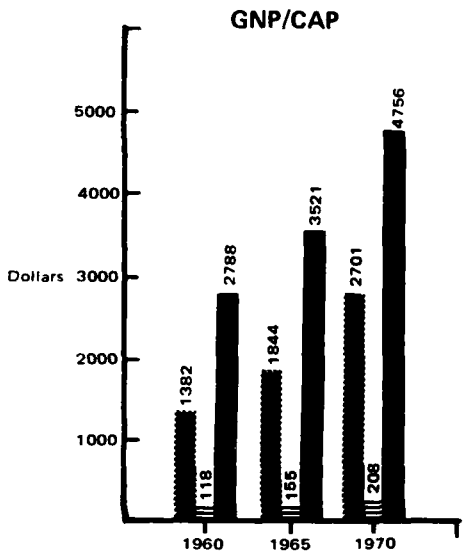

USA
Developed Countries
Less Developed Countries
Population
Millions of People
2500
2000
1500
1000
500
880
2130
181
940
2355
195
986
2666
205
1960
1965
1970
Rate of Growth
Percent
2.5
2.0
1.5
1.0
.5
1.3
2.4
1.6
1.1
2.5
1.2
.97
2.4
1.0
1960
1965
1970

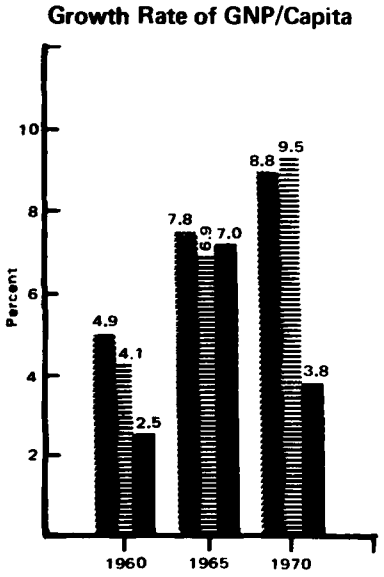
LIVING STANDARDS

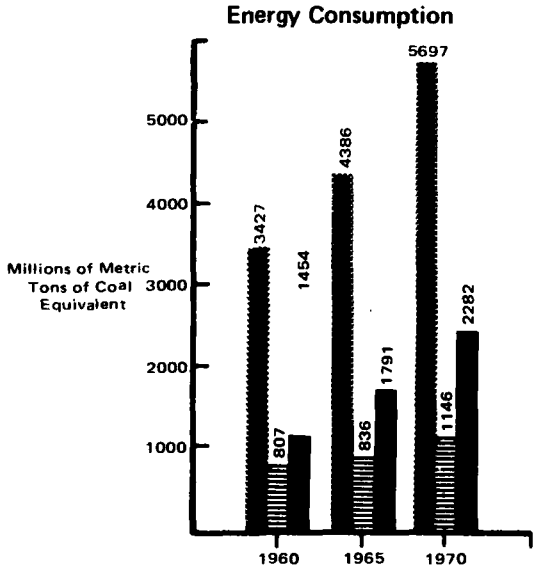


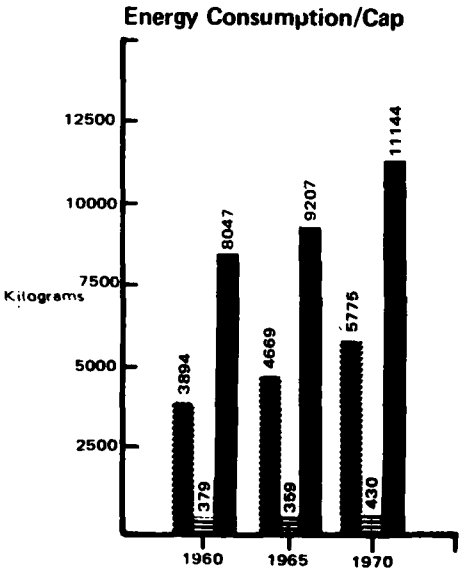
LIVING STANDARDS (CONT.)



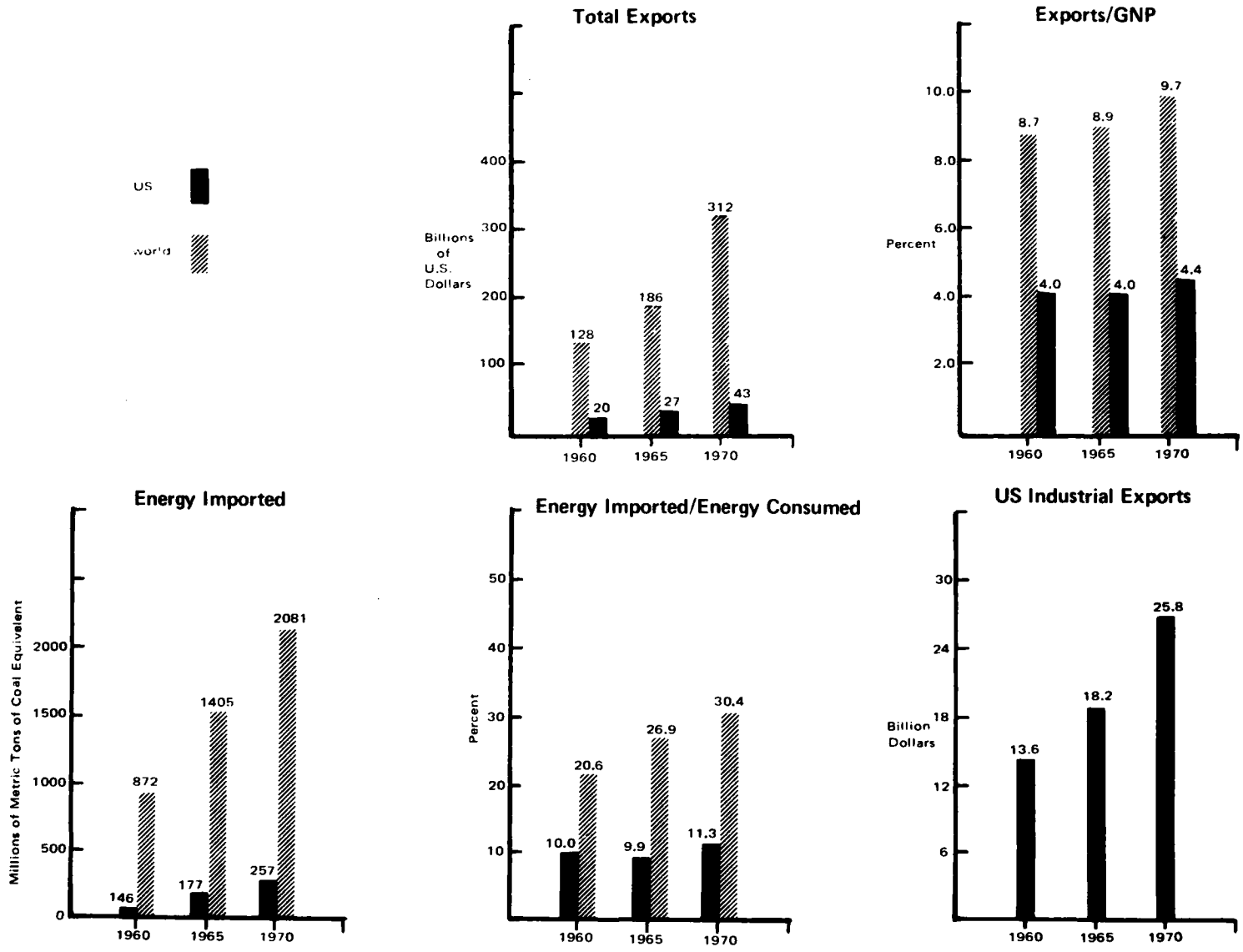








INTERDEPENDENCE



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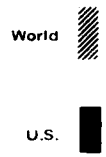

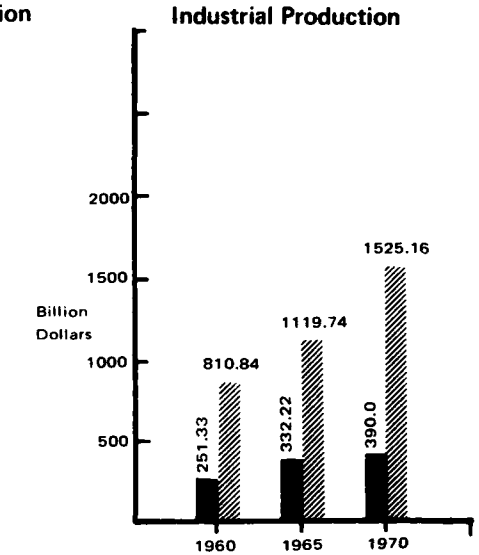

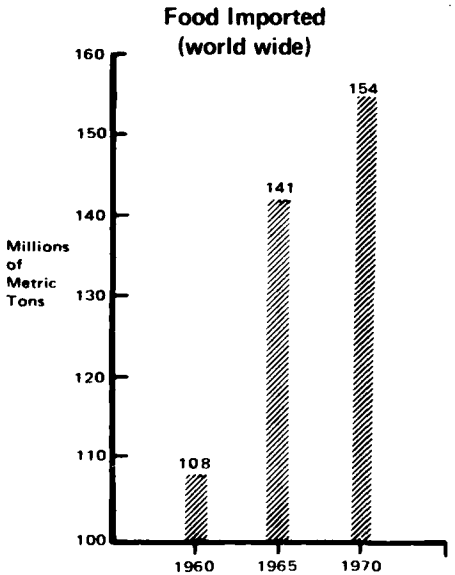

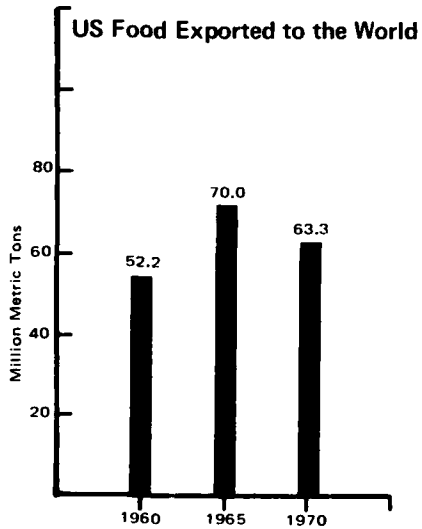

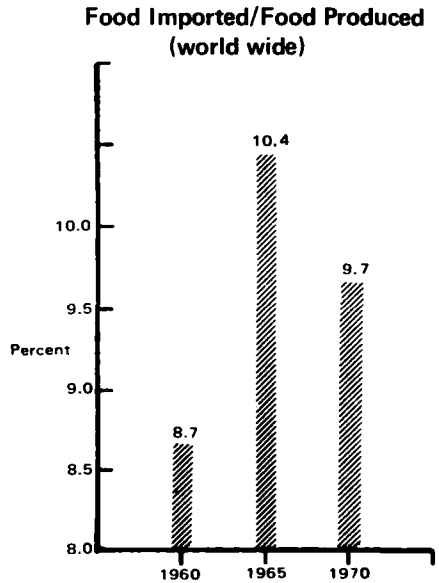

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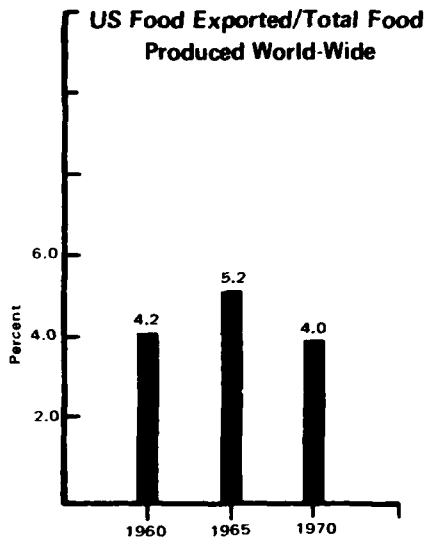

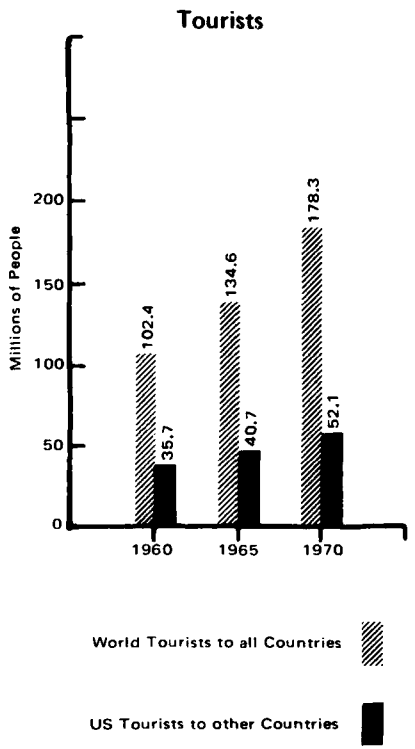

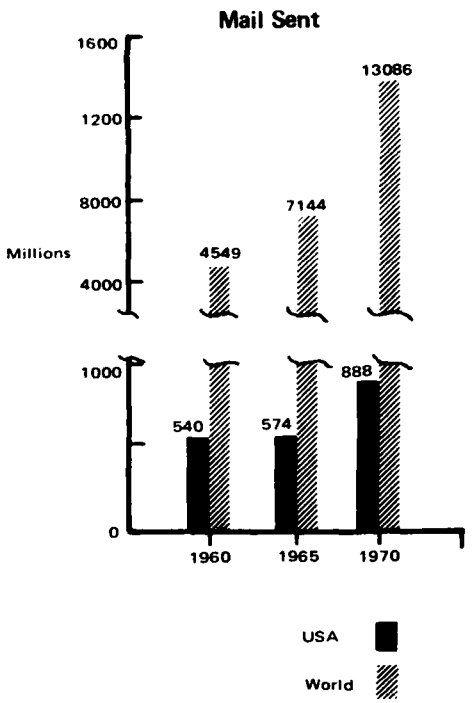

INTERDEPENDENCE (CONT.)

To The World

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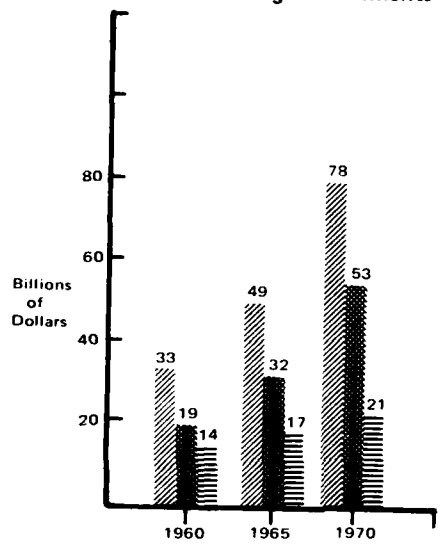
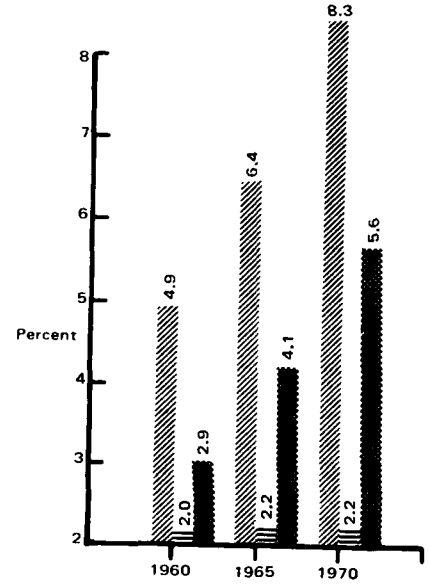
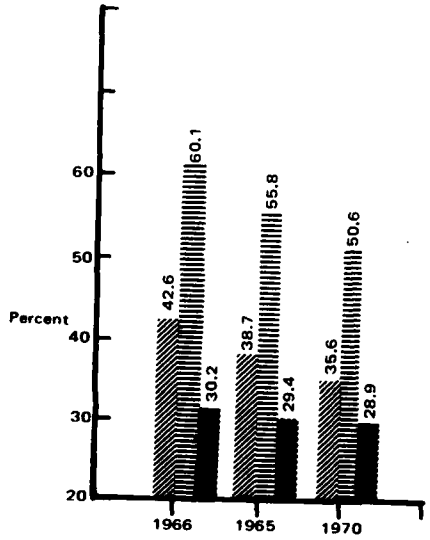
US Direct Foreign Investments



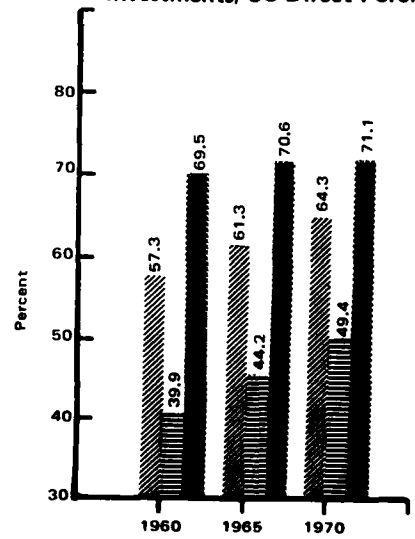
US Direct Foreign Investment/US Total Direct Capital Assets



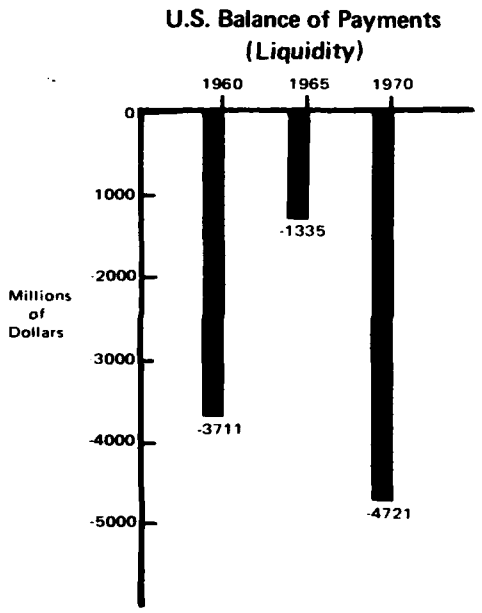
US Foreign Petroleum and Mining Investments/US Direct Foreign Investments

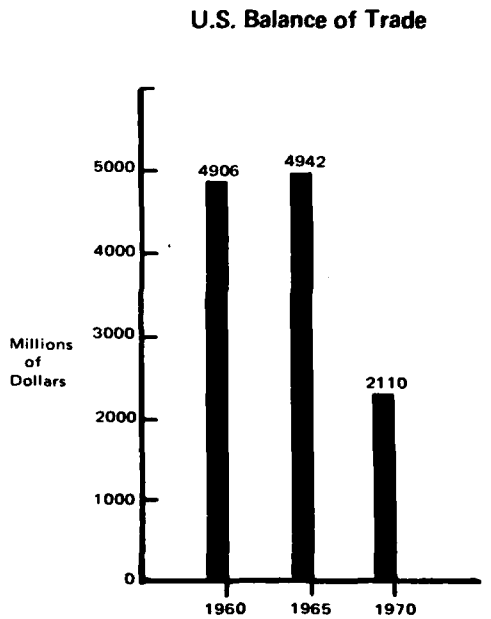


US Foreign Manufacturing and Other Investments/US Direct Foreign Investments

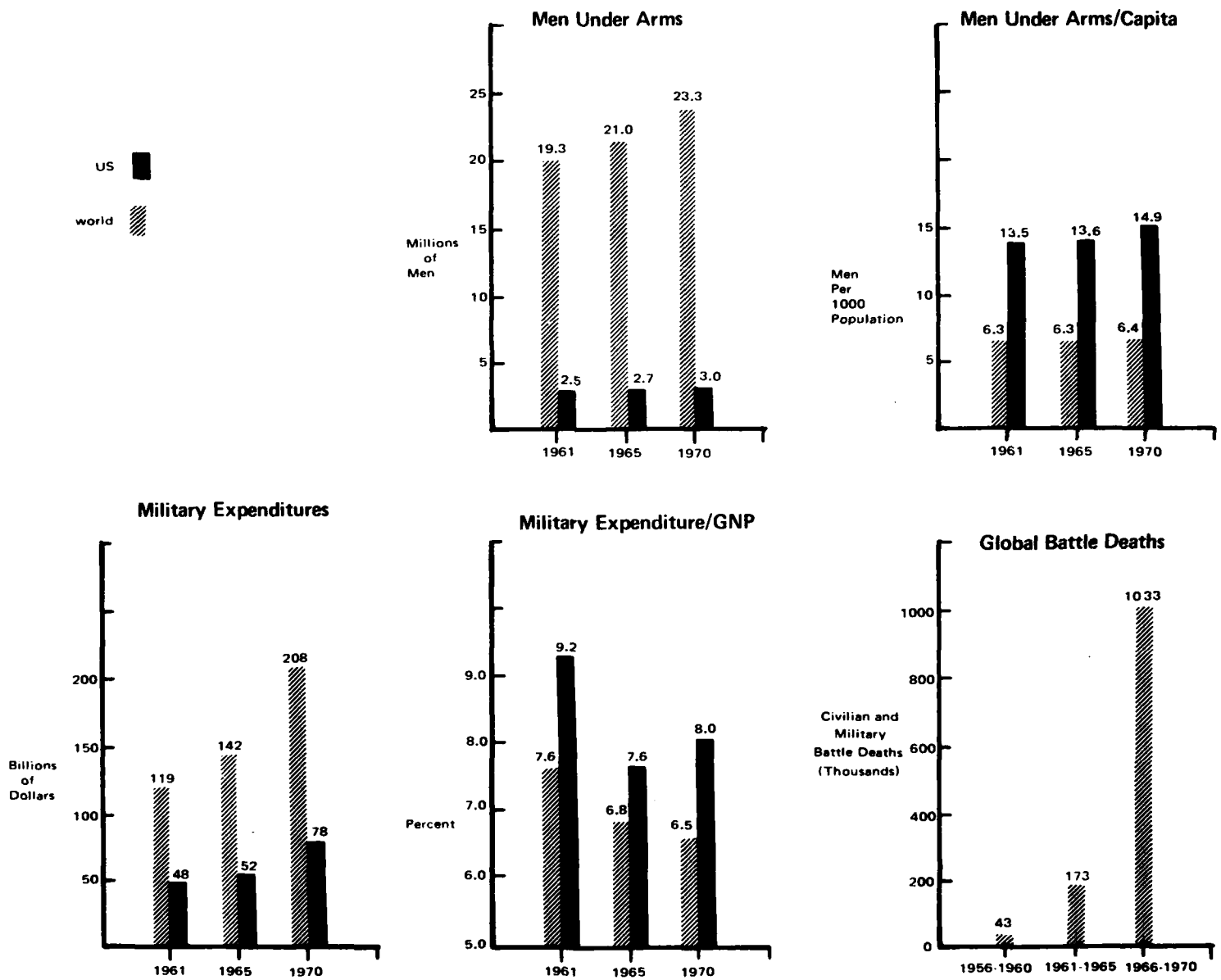


INTERDEPENDENCE (CONT.)





WAR AND PEACE



POPULATION

Variable	Developed Countries			Less Developed Countries			United States		
	1960	1965	1970	1960	1965	1970	1960	1965	1970
Population (millions)	880.1	939.5	986.4	2,129.9	2,355.0	2,665.5	180.7	194.5	205.3
Rate of Growth (%)	1.3	1.1	.97	2.4	2.5	2.4	1.6	1.2	1.0

LIVING STANDARDS

Variable	World 1960	World 1965	World 1970	United States 1960	United States 1965	United States 1970
Proteins (grams per day)	64	68	66.9	92.4	93.3	98.6
Calories (per day)	2360	2366	2409	3120	3140	3300
Literacy (%)	48	56	64	99	99	99

Variable	Developed Countries 1960	Developed Countries 1965	Developed Countries 1970	Less Developed Countries 1960	Less Developed Countries 1965	Less Developed Countries 1970	United States 1960	United States 1965	United States 1970
GNP (bil $)	1216.4	1732.9	2663.9	251.3	364.7	555.4	503.8	684.9	976.4
GNP/Capita ($)	1382	1844	2701	118	155	208	2788	3521	4756
Growth Rate of GNP/cap (%)	4.9	7.8	8.8	4.1	6.9	9.5	2.5	7.0	3.8
Energy Consumption (mil metric tons coal equiv.)	3426.91	4386.47	5696.93	806.57	835.51	1146.32	1453.96	1790.76	2282.32
Energy Consumption/cap (kilograms coal equiv.)	3894	4669	5775	379	359	430	8047	9207	11,144

INTERDEPENDENCE

Variable	United States 1960	United States 1965	United States 1970	World 1960	World 1965	World 1970
Total Exports (bil $)	20.412	27.189	42.590	128.000	186.400	311.500
Exports/GNP (%)	4.0	4.0	4.4	8.7	8.9	9.7
Energy Imported (mil metric tons of coal equiv.)	145.7	176.54	257.3	872.3	1,405.31	2,081.3
Energy Imported/Energy Consumed (%)	10.0	9.9	11.3	20.6	26.9	30.4
Industrial Exports (bil $)	13.6	18.2	25.8			
Industrial Exports/Industrial Production (%)	5.4	5.5	6.6			
Industrial Production (bil $)	251.33	332.22	390.0	810.84	1,119.74	1,525.16
Food Imported (mil metric tons)				107.82	141.36	153.93
U.S. Food Exported (mil metric tons)				52.2	70.0	63.3
Food Imported/Total Food Produced (%)				8.7	10.4	9.7
U.S. Food Exported/Total Food Produced (%)				4.2	5.2	4.0
Tourists (millions)	35.7	40.7	52.1	102.4	134.6	178.3
Mail Sent (millions)	540	574	888	4549	7144	13,086

INTERDEPENDENCE (Continued)

Variable	To the World			To Less Developed Countries			To Developed Countries		
	1960	1965	1970	1960	1965	1970	1960	1965	1970
U.S. Direct Foreign Investments (bil $)	32,778	49,328	78,178	13,509	17,378	21,448	19,269	31,950	53,145
U.S. Direct Foreign Investments/ U.S. Total Direct Capital Assets (%)	4.9	6.4	8.3	2.0	2.2	2.2	2.9	4.1	5.6
U.S. Foreign Petroleum & Mining Investments/ U.S. Direct Foreign Investments (%)	42.6	38.7	35.6	60.1	55.8	50.6	30.2	29.4	28.9
U.S. Foreign Manufacturing & Other Investments/ U.S. Direct Foreign Investments (%)	57.3	61.3	64.3	39.9	44.2	49.4	69.5	70.6	71.1
U.S. Balance of Payments (mil $)	-3711	-1335	-4721						
U.S. Balance of Trade (mil $)	4906	4942	2110						

WAR AND PEACE

Variable	World			United States		
	1961	1965	1970	1961	1965	1970
Men Under Arms (millions)	19.255	21.029	23.370	2.483	2.655	3.066
Men Under Arms/Capita (per thousand)	6.3	6.3	6.4	13.5	13.6	14.9
Military Expenditures (bil $)	119.153	141.853	208.496	47.808	51.827	77.827
Military Expenditures/GNP (%)	7.6	6.8	6.5	9.2	7.6	8.0
Battle Deaths (thousands)	43	173	1033			

IV. VARIABLES: DEFINITIONS, MEASUREMENTS, AND SOURCES

POPULATION

1. Population

   a. Definition: The number of people designated in official records and in unofficial estimates to be residents of developed and developing nations and of the United States.

   b. Measurement: Value given is in millions of people.

   c. Data Sources:

      (1) World Military Expenditures 1971, U. S. Arms Control and Disarmament Agency, July, 1972.

      (2) United Nations Demographic Yearbook, 1963, United Nations Statistical Office, 1964.

2. Rate of Growth

   a. Definition: The change in population from year P-1 to year P divided by the population in year P-1.

   b. Measurement: The value recorded is expressed as a percent.

   c. Data Sources:

      (1) World Military Expenditure 1971, U. S. Arms Control and Disarmament Agency, July, 1972.

      (2) United Nations Demographic Yearbook, 1963, United Nations Statistical Office, 1964.

LIVING STANDARDS

1. Proteins

   a. Definition: The number of total proteins consumed per day per capita.

   b. Measurement: Value given is in grams per day per capita.

   c. Data Sources:

      (1) Production Yearbook 1971, Food and Agriculture Organization of the United Nations, 1972.

      (2) The State of Food and Agriculture 1972, Food and Agriculture Organization of the United Nations, 1972.

      (3) The World Food Problem, Willard W. Cochrane, Thomas V. Crowell Company, Inc., 1969.

      (4) The World Food Problem, A Report of the President's Science Advisory Committee Volume II, The White House, 1967.

      (5) World Food Problems 1964-1969, Food and Agriculture Organization of the United Nations, 1964.

2. Calories

   a. Definition: The total number of calories consumed per day per capita.

   b. Measurement: Value given is in calories per day per capita.

   c. Data Sources:

      (1) Production Yearbook 1971, Food and Agriculture Organization of the United Nations, 1972.

      (2) The State of Food and Agriculture 1972, Food and Agriculture Organization of the United Nations, 1972.

      (3) The World Food Problem, Willard W. Cochrane, Thomas V. Crowell Company, Inc., 1969.

(4) The World Food Problem, A Report of the President's Science Advisory Committee Volume II, The White House, 1967.

(5) World Food Problems, 1964-1969, Food and Agriculture Organization of the United Nations, 1964.

3. Literacy

a. Definition: Percent of the population over ten years of age able to read and write.

b. Measurement: Value given is a percent.

c. Data Sources:

(1) United Nations Demographic Yearbook 1963, United Nations Statistical Office, 1964.

(2) National Intelligence Survey, Basic Intelligence Factbook, January 1973, Central Intelligence Agency.

(3) 1965 data estimated from 1960 and 1970 data.

4. GNP

a. Definition: An economy's total output of goods and services, valued at current market prices paid by the ultimate consumer.

b. Measurement: Value given is in billions of current U.S. dollars.

c. Data Sources:

(1) Handbook of Basic Economic Statistics, Economic Statistics Bureau of Washington, D. C. 1972.

(2) World Military Expenditures 1971, U. S. Arms Control and Disarmament Agency, July 1972.

(3) United Nations Statistical Yearbook 1964, United Nations Statistical Office, 1965.

5. GNP/Capita

a. Definition: The GNP divided by total population.

b. Measurement: The value given is in current U.S. dollars.

c. Data Sources:

(1) Handbook of Basic Economic Statistics, Economic Statistics Bureau of Washington, D.C., 1972.

(2) World Military Expenditures 1971, U. S. Arms Control and Disarmament Agency, July 1972.

(3) United Nations Demographic Yearbook 1963, United Nations Statistical Office, 1964.

(4) United Nations Statistical Yearbook 1964, United Nations Statistical Office, 1965.

(5) Survey of Current Business 1969 Supplement, U.S. Office of Business Economics, 1969.

6. Growth Rate of GNP/Capita

a. Definition: The change in GNP/capita from year Y-1 to year Y divided by the GNP/capita in year Y-1.

b. Measurement: Value given is a percent.

c. Data Sources:

(1) Handbook of Basic Economic Statistics, Economic Statistics Bureau of Washington, D.C., 1972.

(2) World Military Expenditures 1971, U. S. Arms Control and Disarmament Agency, July, 1972.

(3) United Nations Demographic Yearbook 1963, United Nations Statistical Office, 1964.

(4) Survey of Current Business 1969 Supplement, U.S. Office of Business Economics, 1969.

(5) United Nations Statistical Yearbook 1964, United Nations Statistical Office, 1965.

7. Energy Consumption

a. Definition: The apparent consumption of coal lignite, petroleum products, natural gas and hydro and nuclear electricity based on official data and unofficial records.

b. Measurement: Value given is in million metric tons of coal equivalent.

c. Data Sources:

(1) United Nations Statistical Yearbook 1964, United Nations Statistical Office, 1965.

(2) United Nations Statistical Yearbook 1968, United Nations Statistical Office, 1969.

(3) United Nations Statistical Yearbook 1971, United Nations Statistical Office, 1972.

8. Energy Consumption/Capita

a. Definition: Energy consumption divided by the total population.

b. Measurement: Value given is in kilograms of coal equivalent.

c. Data Sources:

(1) United Nations Statistical Yearbook 1964, United Nations Statistical Office, 1965.

(2) United Nations Statistical Yearbook 1968, United Nations Statistical Office, 1969.

(3) United Nations Statistical Yearbook 1971, United Nations Statistical Office, 1972.

(4) United Nations Demographic Yearbook 1963, United Nations Statistical Office, 1964.

(5) World Military Expenditures 1971, U. S. Arms Control and Disarmament Agency, July 1972.

INTERDEPENDENCE

1. Total Exports

   a. Definition: The value of goods shipped out of a country.

   b. Measurement: Value given is in billions U.S. dollars.

   c. Data Sources:

      (1) United Nations Yearbook of International Trade Statistics 1969, Statistical Office of the United Nations, 1971.

      (2) United Nations Statistical Yearbook 1971, Statistical Office of the United Nations, 1972.

      (3) United Nations Statistical Yearbook 1967, Statistical Office of the United Nations, 1968.

      (4) United Nations Statistical Yearbook 1964, Statistical Office of the United Nations, 1965.

2. Total Exports/GNP

   a. Definition: Total exports divided by the GNP.

   b. Measurement: Value given is a percent.

   c. Data Sources:

      (1) United Nations Statistical Yearbook 1971, United Nations Statistical Office, 1972.

      (2) United Nations Statistical Yearbook 1964, United Nations Statistical Office, 1965.

      (3) United Nations Statistical Yearbook 1967, United Nations Statistical Office, 1968.

      (4) World Military Expenditures 1971, U.S. Arms Control and Disarmament Agency, July, 1972.

(5) United Nations Yearbook of International Trade Statistics 1969, Statistical Office of the United Nations, 1971.

(6) Handbook of Basic Economic Statistics, Economic Statistics Bureau of Washington, D. C., 1972.

3. Energy Imported

a. Definition: Total imports of solid fuels (coal and lignite), crude petroleum, refined oil fuels and natural gas.

b. Measurement: Value given is million metric tons of coal equivalent.

c. Data Sources:

(1) World Energy Supplies 1966-1969, United Nations Statistical Office, 1971.

(2) World Energy Supplies 1964-1967, United Nations Statistical Office, 1969.

(3) World Energy Supplies 1962-1965, United Nations Statistical Office, 1967.

(4) World Energy Supplies 1959-1962, United Nations Statistical Office, 1964.

(5) 1970 data for the U.S. and the world estimated from 1969 data.

(6) 1960 data for the U. S. and the world estimated from 1962 data.

4. Energy Imported/Energy Consumed

a. Definition: Energy imported divided by energy consumed.

b. Measurement: Value given is a percent.

c. Data Sources:

(1) United Nations Statistical Yearbook 1964, United Nations Statistical Office, 1965.

(2) United Nations Statistical Yearbook 1968, United Nations Statistical Office, 1969

(3) United Nations Statistical Yearbook 1971, United Nations Statistical Office, 1972.

(4) World Energy Supplies 1966-1969, United Nations Statistical Office, 1971.

(5) World Energy Supplies 1964-1967, United Nations Statistical Office, 1969.

(6) World Energy Supplies 1962-1965, United Nations Statistical Office, 1967.

(7) World Energy Supplies 1959-1962, United Nations Statistical Office, 1964.

(8) 1970 data for energy consumed for the U.S. and the world estimated from 1969 data.

(9) 1960 data for energy consumed for the U.S. and the world estimated from 1962 data.

5. Industrial Exports

a. Definition: The total value of mining, petroleum, equipment and manufactured goods exported from the U.S.

b. Measurement: Value given is in billions of dollars.

c. Data Sources:

(1) Survey of Current Business, U. S. Office of Business Economics, U. S. Department of Commerce, August, 1971.

(2) Survey of Current Business, U.S. Office of Business Economics, U. S. Department of Commerce, August 1967.

(3) Survey of Current Business 1963, Biennial Edition, U. S. Office of Business Economics, U. S. Department of Commerce, August 1963.

(4) United Nations International Trade Statistics, United Nations Statistical Office, 1970.

(5) Industrial exports for 1970 is 1969 data.

6. Industrial Exports/Industrial Production

a. Definition: The total value of industrial exports of the U. S. divided by the total value of the industrial production of the U. S.

b. Measurement: Value given is a percent.

c. Data Sources:

(1) Survey of Current Business, U. S. Office of Business Economics, U. S. Department of Commerce, August, 1971.

(2) Survey of Current Business, U. S. Office of Business Economics, U. S. Department of Commerce, August, 1967.

(3) Survey of Current Business 1963, Biennial Edition, U. S. Office of Business Economics, U. S. Department of Commerce, August, 1963.

(4) United Nations Statistical Yearbook 1963, United Nations Statistical Office, 1964.

(5) United Nations Statistical Yearbook 1967, United Nations Statistical Office, 1968.

(6) United Nations Statistical Yearbook 1968, United Nations Statistical Office, 1969.

(7) United Nations Statistical Yearbook 1971, United Nations Statistical Office, 1972.

(8) 1972 Commodity Yearbook, Commodity Research Bureau, Inc., 1972.

(9) Industrial Production, Organization of Economic Co-operation and Development, 1972.

(10) United Nations International Trade Statistics, United Nations Statistical Office, 1970.

(11) Industrial exports for 1970 is 1969 data.

7. Industrial Production

a. Definition: The total value of mining, petroleum, equipment and manufactured goods produced.

b. Measurement: Value given is in billions of U.S. dollars.

c. Data Sources:

(1) United Nations Statistical Yearbook 1963, United Nations Statistical Office, 1964.

(2) United Nations Statistical Yearbook 1967, United Nations Statistical Office, 1968.

(3) United Nations Statistical Yearbook 1968, United Nations Statistical Office, 1969.

(4) United Nations Statistical Yearbook 1971, United Nations Statistical Office, 1972.

(5) 1972 Commodity Yearbook, Commodity Research Bureau, Inc., 1972.

(6) Industrial Production, Organization of Economic Co-operation and Development, 1972.

8. Food Imported

a. Definition: Food and live animals imported into all countries of the world. Includes grains, fruit and dairy products. Excludes tobacco, tea, coffee, and fishery products.

b. Measurement: Value given is in million metric tons.

c. Data Sources:

(a) The State of Food and Agriculture 1972, Food and Agriculture Organization of the United Nations, 1972.

9. U. S. Food Exported

a. Definition: The value of food including grains, fruit, dairy products, meat and live animals which is exported from the U. S. (excludes tobacco, tea, coffee, and fishery products.)

b. Measurement: Value given is in million metric tons.

c. Data Sources:

(1) United Nation Yearbook of International Trade Statistics, United Nations Statistical Office, 1962.

(2) United Nations Yearbook of International Trade Statistics, United Nations Statistical Office, 1968.

(3) United Nations Yearbook of International Trade Statistics, United Nations Statistical Office, 1969.

10. Food Imported/World Wide Food Production

a. Definition: Total food imported throughout the world divided by the total world food production.

b. Measurement: Value given is a percent.

c. Data Sources:

(a) The State of Food and Agriculture 1972, Food and Agriculture of the United Nations, 1972.

11. U.S. Food Exported/Total Food Produced

a. Definition: U.S. food exported divided by total food produced in the world. World food production includes grains, fruit, dairy products, meat and live animals, excludes tobacco, tea, coffee, and fishery products.

b. Measurement: Value given is a percent.

c. Data Sources:

(1) U. S. Foreign Agricultural Trade Statistical Report, Fiscal Year, 1971, Economic Research Service, U. S. Department of Agriculture, 1971.

(2) The State of Food and Agriculture 1972, Food and Agriculture of the United Nations, 1972.

12. Tourists

a. Definition: The number of nationals who have crossed the border into another country.

b. Measurement: Value given is expressed in millions of people.

c. Data Sources:

(1) United Nations Statistical Yearbook 1971, United Nations Statistical Office, 1972.

(2) United Nations Statistical Yearbook 1966, United Nations Statistical Office, 1967.

(3) United Nations Statistical Yearbook 1963, United Nations Statistical Office, 1964.

13. Mail Sent

a. Definition: Number of letters sent from the United States to the world and number of letters sent from all countries of the world to all countries of the world.

b. Measurement: Value given is in millions.

c. Data Sources:

(1) United Nations Statistical Yearbook 1971, United Nations Statistical Office, 1972.

(2) United Nations Statistical Yearbook 1964, United Nations Statistical Office, 1965.

14. U. S. Direct Foreign Investments

a. Definition: The total amount of capital which the United States has invested abroad.

b. Measurement: Value given is in billions of dollars.

c. Data Sources:

(1) Survey of Current Business, U. S. Department of Commerce, Social and Economic Statistics Administration, Bureau of Economic Analysis, November 1972.

(2) Survey of Current Business, Bureau of Economic Analysis, September 1967.

(3) Survey of Current Business, U. S. Department of Commerce, Social and Economic Statistics Administration, Bureau of Economic Analysis, August 1962.

15. U. S. Direct Foreign Investments/ U. S. Total Direct Capital Assets

a. Definition : Percent of direct U. S. capital assets which are invested abroad.

b. Measurement: Value given is a percent.

c. Data Sources:

(1) Survey of Current Business, U. S. Department of Commerce, Social and Economic Statistics Administration, Bureau of Economic Analysis, November 1972.

(2) Survey of Current Business, U. S. Department of Commerce, Social and Economic Statistics Administration, Bureau of Economic Analysis, September 1967.

(3) Survey of Current Business, U. S. Department of Commerce, Social and Economic Statistics Administration, Bureau of Economic Analysis, August 1962.

(4) Survey of Current Business, U. S. Department of Commerce, Social and Economic Statistics Administration, Bureau of Economic Analysis, April 1970.

(5) 1970 data for U. S. total direct capital assets estimated from 1969 data.

16. U. S. Foreign Petroleum and Mining Investments/U. S. Direct Foreign Investments

a. Definition: Percent of the total U.S. direct foreign investments which are invested in mining and smelting and petroleum.

b. Measurement: Value given is a percent.

c. Data Sources:

(1) Survey of Current Business, U. S. Department of Commerce, Social and Economic Statistics Administration, Bureau of Economic Analysis, November 1972.

(2) Survey of Current Business, U. S. Department of Commerce, Social and Economic Statistics Administration, Bureau of Economic Analysis, September 1967.

(3) Survey of Current Business, U. S. Department of Commerce, Social and Economic Statistics Administration, Bureau of Economic Analysis, August 1961.

17. U. S. Foreign Manufacturing and Other Investments/U. S. Direct Foreign Investments

a. Definition: Percent of total U. S. direct foreign investments which are invested in manufacturing and other industries (includes public utilities and trade).

b. Measurement: Value given is a percent.

c. Data Sources:

(1) Survey of Current Business, U. S. Department of Commerce, Social and Economic Statistics Administration, Bureau of Economic Analysis, November 1972.

(2) Survey of Current Business, U. S. Department of Commerce, Social and Economic Statistics Administration, Bureau of Economic Analysis, September 1967.

(3) Survey of Current Business, U. S. Department of Commerce, Social and Economic Statistics Administration, Bureau of Economic Analysis, August 1961.

18. U. S. Balance of Payments

a. Definition: Liquidity balance, excluding allocations of special drawing rights, for the United States.

b. Measurement: Value given is in millions of dollars.

c. Data Sources:

(1) Survey of Current Business, U. S. Office of Business Economics, June 1971.

19. U. S. Balance of Trade

a. Definition: Merchandise trade balance (exports-imports) for the United States.

b. Measurement: Value given is in millions of dollars.

c. Data Sources:

(1) Survey of Current Business, U. S. Office of Business Economics, June 1971.

WAR AND PEACE

1. Men Under Arms

   a. Definition: Military personnel actually on duty, including paramilitary forces where these forces are trained and equipped along military lines, contribute substantially to a country's military capabilities, and are funded from the central defense budget. Reserve forces are not included.

   b. Measurement: Value given is in millions of men.

   c. Data Sources:

      (1) World Military Expenditures 1971, U.S. Arms Control and Disarmament Agency, July 1972.

2. Men Under Arms/Capita

   a. Definition: Number of men per thousand population who are under arms (as defined above).

   b. Measurement: Value given is number of men per thousand population.

   c. Data Sources:

      (1) World Military Expenditures 1971, U.S. Arms Control and Disarmament Agency, July 1972.

3. Military Expenditures

   a. Definition: The amount of money actually spent for military purposes.

   b. Measurement: Value given is in billions of current U.S. dollars.

   c. Data Sources:

      (1) World Military Expenditures 1971, U.S. Arms Control and Disarmament Agency, July 1972.

4. Military Expenditures/GNP

   a. Definition: That portion of the GNP which is devoted to military expenditures.

b. Measurement: Value given is a percent of GNP.

c. Data Sources:

(1) World Military Expenditures 1971, U. S. Arms Control and Disarmament Agency, July 1972.

5. Battle Deaths

a. Definitions: Number of military and civilian personnel killed in international conflicts aggregated over five year time periods (excludes North Vietnamese civilian deaths).

b. Measurement: Value given is in thousands.

c. Data Sources:

(1) The Wages of War 1816-1965, A Statistical Handbook, J. David Singer and Melvin Small, 1972.

(2) Office of the Assistant Secretary of Defense for Public Affairs.

(3) Defense Intelligence Agency.