

EIR Feature

The U.S.A. needs ten million new machine-tools

by Robert Gallagher

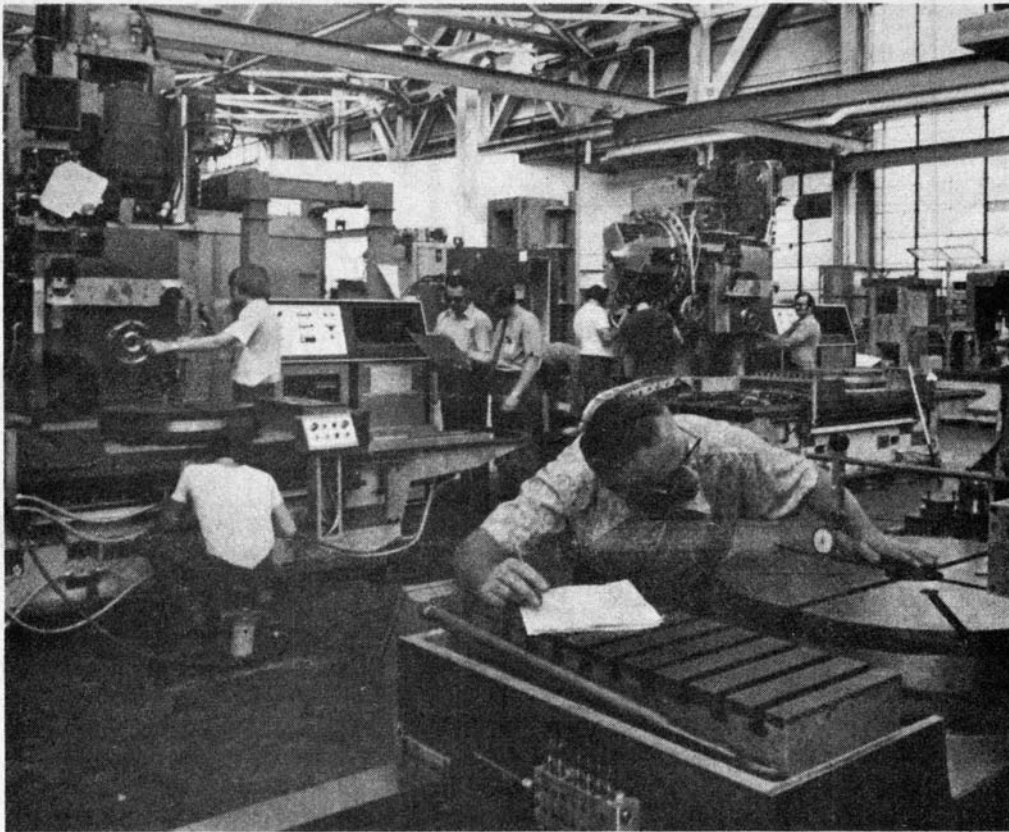
As one of the first steps in the defense mobilization required to defeat the Russian Empire and create a second industrial revolution, the United States requires investment in the production of metal-cutting and metal-forming machine-tools, at present levels of technology, of approximately \$600 billion. This result argues for the fastest-possible implementation of laser machining, first throughout the U.S. machine-tool industry itself (Standard Industry Classifications 3541 and 3542), and then throughout all basic metalworking industries critical to national defense and economic expansion in capital goods.

The size of this calculated deficit in machine-tool building will not surprise anyone who has followed the catastrophic collapse of the machine-tool industry since its height in 1967. In the 10 years between 1973 and 1983, the number of machine-tools in use in metalworking in the United States dropped 28%, and over two-thirds of this remaining stock is officially classified as "over-age" by the *American Machinist* (Table 1, Figure 1).

The number of metalworking machine-tools in use for each member of the labor force in 1983 was half the 1963 value of 38 per thousand workers. The fact that the number of tools in use per industrial operative declined only 25% over the same period, only shows that the industrial operative is disappearing as fast as our capital-goods industries (Table 3, Figure 2).

Total shipments of heavy metal-forming machine-tools in 1984 were 46% of 1974 levels, and 1984 shipments of heavy metal-cutting machine-tools were a mere 35% of the 1967 value of 86,000. In the intervening time, imports have risen to constitute some 40% of domestic consumption of heavy machine-tools (Tables 6-8, Figures 3-4).

On a per-capita basis, shipment of heavy metal-cutting tools in 1984 was 29% of its 1967 value of 432 per thousand persons. The decline in shipments per industrial operative over the same period is only 35%, for the discouraging reason



Cincinnati Milacron

As America's machine-tool stock becomes more and more obsolescent, the Russian Empire is gearing up for war. A \$600 billion investment in metal-cutting and metal-forming machine tools is urgently required. Shown are computer-controlled machine tools in a Cincinnati plant.

cited above. The present disastrous state of our capital-goods industries can be summed up by citing the fact that we now produce fewer heavy metal-cutting machine-tools than the backward Russian economy did in 1937, according to the *CIA Handbook of Economic Statistics* (Figures 5-6).

The Machine Tool Builders Association, the representatives of that branch of industry which constructs industrial fasteners, and the Forgings Association, have since the late 1970s, demanded relief for their collapsing industries on national security grounds. The machine-tool builders, like the other two agencies cited, have argued that the growing preponderance of foreign imports in each of the cited areas, now over 40%, is in itself a national security threat.

Under the Carter administration, and again under Reagan, these branches of industry, without which there is no modern industrial economy, have been turned down cold. Michael Blumenthal, treasury secretary in the Carter administration, argued that since the next war would be thermonuclear, and everything would be destroyed in less than half an hour, there was no need to protect the capabilities of the national industry.

The Reagan administration has thus far taken a different tack. Reagan's State Department, which rules in these areas of defense-related industrial capabilities, argues that Western Europe would be the likely theater for hostilities between the United States and the Soviet Union. Reagan's State Department concedes that Atlantic shipping lines may be interdicted

by Russian military action, breaking connection with Europe. However, the department points out, that trade for these associations is primarily with Asia, and it does not expect trade with Asia to be affected by hostilities in Europe.

Both sides focus on the question, whether or not import dependence is a threat. Neither takes up the more important problem: Is the United States to maintain the productive capacities of its basic industry, or not? That is what is really involved. Can the United States still produce its own national requirements, both for defense and for the civilian economy? A review of the collapse of the machine-tool industry shows that the answer is "No."

The Defense Production Act

The President must immediately establish a plan for carrying out this required investment program, and the implementation of laser machining, in the fastest possible way, under the powers granted him by the Defense Production Act. Had the specifications of that act been followed, as the law should be, the present catastrophe would not be upon us. But successive administrations have violated the law of the land on behalf of the broader purpose of deindustrializing the nation. They accepted the argument of the lunatics that nuclear warfare made industry obsolete.

The act was designed by its framers to prevent a repeat of the disaster that befell the nation at the outbreak of World War II, by maintaining, and updating, a national stockpile of

Table 1.

Age of metalworking machine-tools in use in metalworking industries, 1953-83 (thousands)

	Total	Under 10 years	10-19 years	Over 20 years	Net new
1983	2,193	718	746	728	- 83
1977	2,631	803	927	901	- 207
1973	3,066	1,010	1,185	871	- 11
1968	2,870	1,021	1,176	672	10
1963	2,809	1,011	1,216	582	124
1958	2,218	887	932	399	- 211
1953	2,475	1,098	914	463	

Source: 7th through 13th American Machinist Inventory of Metalworking Equipment.

Table 2.

Metalworking machine-tools in use in metalworking industries per thousand persons, 1953-83 (units)

	Total (1,000s)	Per 1,000 persons	Under 10 years	Per 1,000 persons
1983	2,193	9.4	718	3.07
1977	2,631	12.0	803	3.65
1973	3,066	14.5	1010	4.76
1968	2,870	14.3	1021	5.08
1963	2,809	14.9	1011	5.35
1958	2,218	12.5	887	5.01
1953	2,475	15.5	1098	6.86

machine-tools, and other equipment and plant necessary for the functioning of industrial production under emergency or mobilization conditions. The lessons of President Franklin D. Roosevelt's World War II mobilization were studied closely. One of the determinations made was that the collapse of the machine-tool industry was one of the principal factors slowing down the acceleration of FDR's buildup from its initiation.

The provisions of the act should be followed to rebuild the machine-tool industry now, in the same way that FDR initiated expansion of the U.S. iron and steel industry in mid-1941, *before U.S. entry into World War II*, through formulation of a plan to increase capacity by 20-25%. Reagan must "take the bull by the horns" and initiate the even greater task that faces the nation today.

Reagan would take this step none too soon. Soviet party boss Mikhail Gorbachov has challenged the President to a technology race in basic industries, especially machine-tools. In a major policy address to the Communist Party Central Committee April 23, Gorbachov called for the Soviets to produce "revolutionary changes . . . modernizing every in-

dustry, on the basis of the latest scientific and technical gains, and reaching the highest world levels in labor productivity. The decisive say," he added, "belongs to the machine-tool sector."

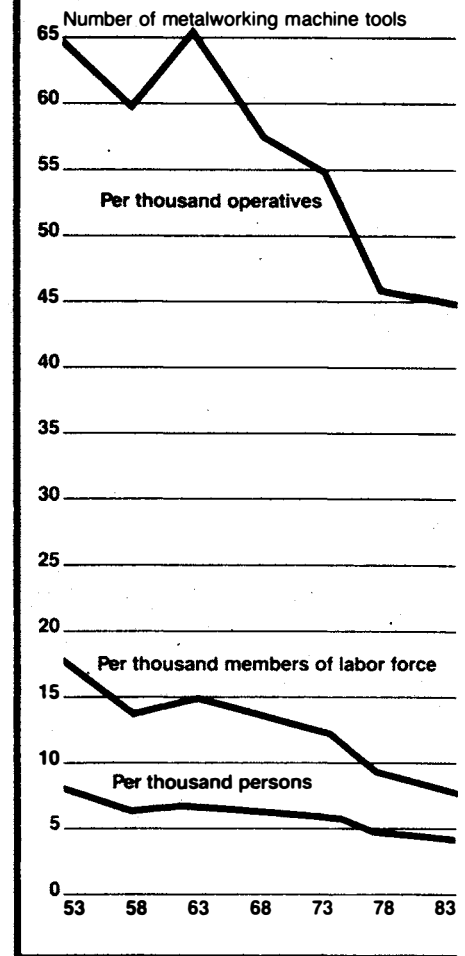
Industries for defense

Any industrial planner can repeat our calculations, and arrive at precisely the same result for the level of needed machine-tool investment. A cursory evaluation of the "bill of materials" required for a "Manhattan Project"-type implementation of the Strategic Defense Initiative, can only conclude that a massive retooling of U.S. metalworking industries is in order.

Among the many metalworking industries that must lead the second industrial revolution and the establishment of peace on our planet are:

1) **Guided missiles and space vehicles.** To place into orbit required hardware for early warning systems, surveillance equipment of all kinds, space-based laser mirrors and pointing and tracking equipment, space-based directed-energy battlestations, and to equip our expanding submarine

Figure 1.



Number of metalworking machine tools under 10 years old in use in the United States

Table 3.

Metalworking machine tools in use in metalworking industries per thousand members of labor force, 1953-1983
(units)

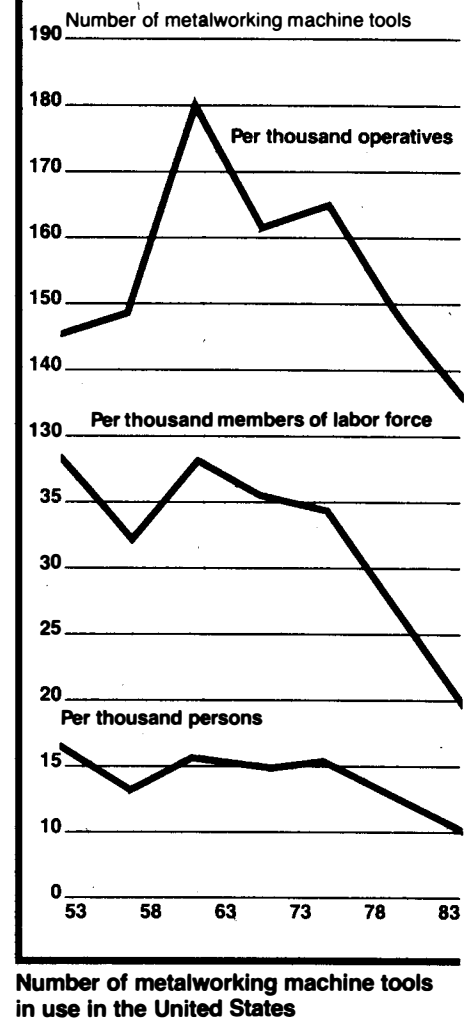
	Total (1,000s)	Per 1,000 persons	Under 10 years	Per 1,000 persons
1983	2,193	19.4	718	6.35
1977	2,631	26.4	803	8.07
1973	3,066	33.7	1010	11.1
1968	2,870	34.9	1021	12.4
1963	2,809	37.7	1011	13.6
1958	2,218	31.6	887	12.6
1953	2,475	37.1	1098	16.5

Table 4.

Metalworking machine-tools in use in metalworking industries per thousand production workers in mining, manufacturing, and construction, 1953-1983
(units)

	Total (1,000s)	Per 1,000 operatives	Under 10 years	Per 1,000 operatives
1983	2,193	135	718	44
1977	2,631	148	803	45
1973	3,066	164	1,010	54
1968	2,870	161	1,021	57
1963	2,809	180	1,011	65
1958	2,218	148	887	59
1953	2,475	145	1,098	64

Figure 2.



force with the necessary rapid-ascent rockets to carry x-ray laser ICBM-killers into space to intercept Soviet ballistic missiles in their boost phase; and to deploy as rapidly as possible, a complete force of the MX Peacekeeper missile.

2) Shipbuilding. To place into the oceans submarines equipped with rockets armed with x-ray lasers; to expand the existing surface and underwater fleet to approximately 1,000 major combatants, with an initial second, but equal, emphasis on deployment of anti-submarine warfare task forces, especially anti-submarine warfare *hunter-killer submarines*; and to equip existing and future aircraft carriers, cruisers, and battleships with directed-energy air defense systems against cruise missiles and short-range ballistic missile warheads.

3) Computers and communications equipment. For deployment in space and for central battle management; radar and other equipment.

4) Aircraft. To produce anti-submarine warfare planes and helicopters, and high altitude aircraft equipped with directed-energy weapons capable of shooting down at Warsaw Pact aircraft in the event of an attack on our allies.

5) Motor vehicles. To produce armored vehicles equipped with directed-energy weapons for deployment in Europe, Israel, and Asia for interception of short- and medium-range missiles and nuclear-armed artillery shells.

6) Primary metal industries. The machine-tool investment program, as shown in Table 9, requires approximately 44 million tons of iron and steel itself. Assuming that a tool must be replaced every 10 years, as demonstrated by the *American Machinist* inventories (see below), once the deficit has been made up, approximately 4.4 million tons of iron and steel will be required to simply rejuvenate existing stock.

This is an amount equal to half the steel produced in the United States every year, if the production claims of the steel producers and the Department of Commerce are to be taken seriously. Even if the whole 44 million tons would not have to be provided at once, a significant amount of the steel necessary to rebuild the machine-tool industry could be found, if we stopped building any more high-rise offices, and so-called downtown redevelopment projects, and simply allocated the steel and concrete we do produce to rebuild our basic industry.

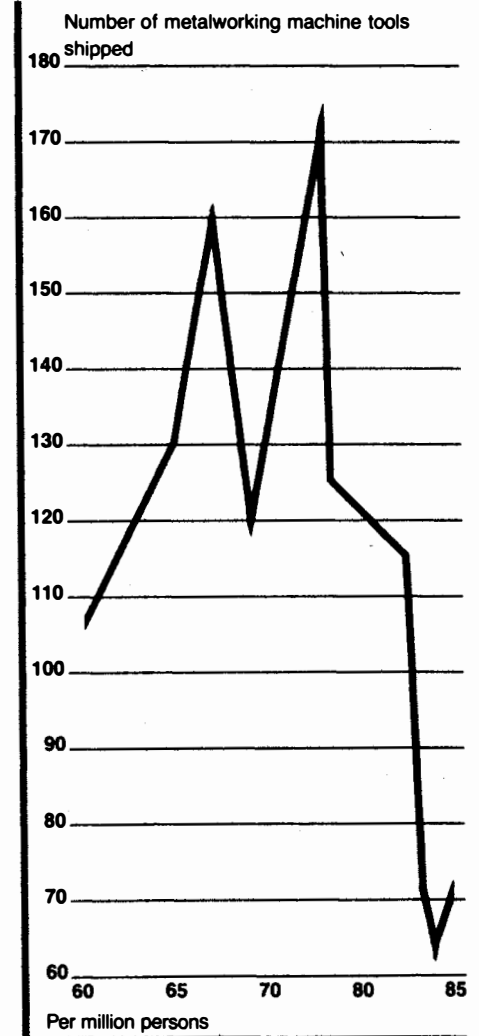
Table 5.

U.S. production of heavy metal-forming machine-tools, 1960-84
(units)

	Total shipments (1000s)	Per million persons	Per million workers	Per million operatives	Per 100 machine-tool operatives
1984	16.9	72		966	
1983	14.8	63	131	909	152
1982	16.7	72	149	1,006	138
1981	21.9	95	199	1,209	139
1980	26.2	115	240	1,424	144
1975	26.8	124	282	1,634	151
1974	36.9	172	397	1,995	182
1970	24.2	118	281	1,383	120
1967	31.6	159	391	1,806	151
1965	25.3	1	329	1,518	137
1960	19.3	107	268	1,237	108

Source for shipment figures: National Machine Tool Builders Association, Economic Handbook of the Machine-Tool Industry, 1984-85. Column 3 is tools shipped per million member of the labor force; column 4 is tools shipped per million production workers in mining, manufacturing and construction; column 5 is tools shipped per 100 machine-tool building production workers.

Figure 3.



Shipments of heavy metal-forming machine tools per capita

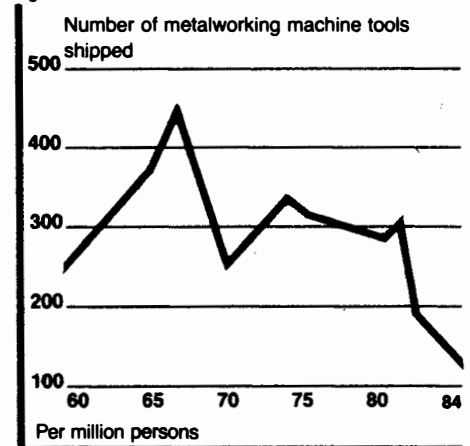
Table 6.

U.S. production of heavy metal-cutting machine-tools, 1960-84
(units)

	Total shipments (1000s)	Per million persons	Per million workers	Per million operatives	Per 100 machine-tool operatives
1984	30	127		1,714	
1983	35.6	152	315	2,187	127
1982	40.5	175	362	2,440	116
1981	66.1	287	601	3,652	138
1980	62.2	273	571	3,380	130
1975	65.9	305	694	4,018	162
1974	69	322	742	3,738	157
1970	49.3	240	573	2,817	108
1967	86	432	1,064	4,914	142
1965	68	351	883	4,079	140
1960	42.9	237	596	2,741	108

Source for shipment figures: NAMTB, Economic Handbook of the Machine Tool Industry, 1984-85. Column 3 is tools shipped per million member of the labor force; column 4 is tools shipped per million production workers in mining, manufacturing and construction; column 5 is tools shipped per 100 machine-tool building production workers.

Figure 4.



Shipments of heavy metal-cutting machine tools per capita

Table 7.

Employees in defense-oriented metalworking companies as a percent of total employment in metalworking

SIC code & industry name	1968*	1978
33 primary metal industries	26	29
34 fabricated metal products	31	40
35 non-electrical machinery	34	61
36 electrical machinery	65	74
37 transportation equipment	65	43
38 precision instruments	65	96
All industries SICs 33-38	44	69
Metalworking employees as percent of labor force	11	8

* Employment figures calculated from Tenth American Machinist Inventory of Metalworking Equipment Source: Statistical Abstract of the U.S., 1971 and 1980.

Table 8.

Estimate of machine-tool investment deficit, 1985

1) Machine-tools per 1,000 operatives 1963	180
2) Size of labor force 1985 (thousands)	113,000
3) Machine-tools less than 10 years old 1983	718,000
4) Average cost of heavy machine-tools (over \$2,500) 1983	64,332*

* Deficit = $[(0.5 \times 113,000 \times 180) - 718,000] = 9,452,000 \times \$64,332 = \$608 \text{ billion} = 167 \text{ times } 1982 \text{ sales of machine-tools}$

Source: Value per machine-tool on line 4 calculated from figures in NMBTA, Economic Handbook of the Machine-Tool Industry, 1984-85, pp. 94-95.

The industrial associations which produce the forgings and castings out of which the machine-tools would be made, are functioning at 50% and less of their rated capacity, and have laid off between one-half and two thirds of their work forces during the course of Paul Volcker's so-called economic recovery.

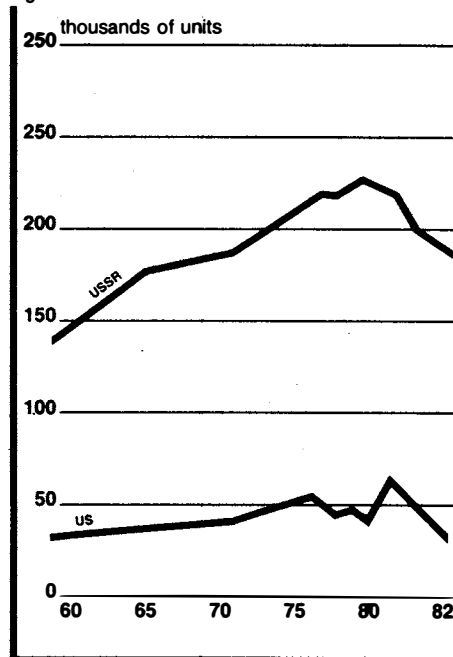
It may further be argued that since machine-tool production workers comprise only 1% of total operatives in metalworking—those operatives that use machine-tools to work up metal—that there is a corresponding deficit of some 4.5 trillion tons of iron and steel in the United States alone, excluding requirements of construction. From the standpoint of replacement, this would require an iron and steel capacity of some 450 million tons per annum, approximately six to seven times greater than existing steel capacity, defined as the capacity of basic oxygen process furnaces.

Defense R&D lowers consumer costs

This list only scratches the surface of the capital-goods sectors whose expansion is required by the Strategic Defense Initiative. Among other industries are: precision instruments, fabricated metal products, and railroad equipment, all for obvious reasons.

This program is the only way to currently revive the U.S. civilian capital-goods industries. Perhaps the most amazing

Figure 5.



U.S. and Soviet production of power-driven machine tools not portable by hand, 1960-82

Source: CIA, Handbook of Economic Statistics, 1983

result of the current *EIR* investigation is that in the period of 1968 to 1978, when Henry Kissinger and the Trilateral Commission decimated U.S. defense programs, and Soviet Russia leaped ahead to worldwide military superiority, it was the civilian sectors of capital-goods industries that suffered most. Over a period when defense allocations shrunk to a mere fraction of need, the percentage of employees in basic metal and capital-goods industries, who worked for defense-oriented firms, *actually rose* from 44% to 69% in 1978, only because the resulting shake-out in the civilian economy was even more vicious than that in defense.

The simple fact of the matter is, that production of advanced military equipment necessitates the retooling of capital-goods industries to a significant degree. This retooling lowers the cost of production of goods throughout the economy as a whole. Conversely, if you shut down high-technology research and development in defense, as the antiballistic-missile program was shut down by Kissinger in the 1969-73 period, without driving capital-goods retooling otherwise, the sector's equipment ages, and with that, the cost of production increases throughout the entire economy.

It might be argued, that the program proposed here is an impossible dream, at a time when U.S. per capita production of iron and steel has collapsed to the levels that existed at the turn of the century. By that metric, today it is 1930. Will we

Table 9.

Gross bill of materials required to make up machine-tool deficit¹

Material	1977 tool industry consumption (1,000 net tons)	Per 1,000 tools shipped (net tons)	Deficit requirement (1,000 net tons)
Metal parts			
Steel mill shapes	285	3,088	29,188
Copper/copper-alloy wire/cable	2.4	26	246
Brass mill shapes	1.9	21	198
Aluminum/aluminum-alloy mill shapes	2	21.7	205
Castings			
Iron	105	1,138	10,756
Steel	19	206	1,947
Aluminum & alloys	2.5	27	255
Copper & alloys	1.3	14	132
Total castings			13,090
Iron/steel forgings	14.1	153	1,446
Iron/steel scrap	11	119	1,125
Total iron/steel		44,462	
Total metal		45,500	
Electric motors			
	(1000 units)	(units)	(1000 units)
Timing	3.8	41	388
Other fractional HP	600.0	6500	61,400
Other fractional HP	600.0	6500	61,400
Integral HP	160	1733	16,380
Machine-tool consumption	7 ²	80 ³	756 ⁴

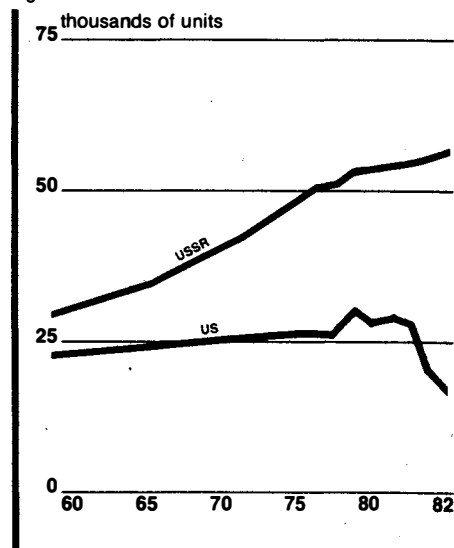
¹ Based on U.S. Census of Manufactures for 1977, data on consumption by machine-tool builders in construction of metal-cutting machine tools (SIC 3541) and metal-forming machine tools (SIC 3542). Per tool figures based on 1977 shipments of 92,300 metal-cutting and metal-forming machine tools. Data on machine-tools in use, in 1977 and 1983, from 12th and 13th *American Machinist Inventories of Metal Working Equipment*.

² In 1977, 70,000 machine tools were in use in the machine-tool building industry. We assume an annual depreciation rate of 10 percent, in accordance with the *American Machinist*.

³ Based on 1977 production of 92,300 heavy machine tools.

⁴ 13 Machine-tools in use in machine tool-building, 1983, under 10 yrs old (1000s); 743 Additional required (1,000s)

Figure 6.



U.S. and Soviet production of power-driven metal-forming machine tools not portable by hand, 1960-82

Source: CIA, *Handbook of Economic Statistics, 1983*

permit the economy to collapse further, as it did into the 1930s, until finally, a President initiated the kind of dirigist action required, at that time in the last resort, for the nation's defense?

The only alternative to this program is continued industrial collapse. There is no bottom to the pit into which humanity can plummet. However, in the 1980s, the United States faces a far more powerful adversary than it faced in the wretched sadists of the fascist alliance. How far can the American nation collapse before that process becomes irreversible from the standpoint of providing even a mere bulwark against Soviet expansionism? Will the American people be capable of throwing over their neurotic fascination with

momentary pleasures and their feelings and emotions, all of which add up, in the accounts of history, to one big zero, and begin, for the first time in decades, to build for a future?

As Lyndon LaRouche has specified, fully 55% of the labor force must become industrial operatives if our nation is to return to healthy economic growth and cease to cannibalize, through the agency of the International Monetary Fund, our allies in South America and elsewhere. From this standpoint, we evaluated the history of the inventory of metal-working machine-tools in the United States since 1953. **Table 4** shows that the number of machine-tools per industrial operative (production workers in mining, manufacturing, and construction) reached its highest point in 1963 of 180 tools

per thousand operatives during the initial deployment of the U.S. ballistic missile force and the grand launching of the Apollo project. Were we to equip fully 55% of the labor force as industrial operatives, with that same power to transform nature, we would require a total machine-tool park of approximately 10 million metal-cutting and metal-forming machine-tools. From this we must deduct the usable inventory of current equipment to arrive at the numbers of new heavy tools required to be built.

According to the *American Machinist Inventory of Metalworking Equipment*, a machine-tool is "over-age," when it is 10 years old. As stated in the Seventh Inventory in 1954:

The 10-year age as a general yardstick for obsolescence was adopted by *American Machinist* in 1925 when the first inventory was taken. . . . The fact is recognized that some types of machines over 10 years old are still quite useful and should not be replaced merely because of their age.

On the other hand, it is equally obvious that much of the equipment less than 10 years old is obsolete in that newer and more efficient units have been developed to do the same work. Some types of equipment wear out faster than others, some plants take better care of their equipment than others, and some equipment is run longer hours than others. . . . There are few machines indeed in their tenth year that are still so profitable and efficient that they cannot profitably be replaced by newer units.

The *American Machinist 1954 Production Planbook* reports that:

A midwestern machinery builder makes an annual survey of the work done by every machine-tool in its shop 10 years old or older. This means that once a machine-tool becomes 10 years of age, it is examined critically every 12 months thereafter to determine whether its work can be done more economically by other machines.

This procedure is part of the company's policy to replace any machine-tool, regardless of age, whenever the required investment can be recovered in savings within a reasonable time. . . .

On this basis, we assumed that only existing machine-tools less than 10 years old could be considered usable inventory for the defense mobilization we are about to launch.

Table 8 shows the arithmetic by which anyone can arrive at our calculated estimated deficit of 10 million heavy machine-tools. Based on the average value of heavy metal-cutting and metal-forming machine-tools shipped in 1983, this represents an investment deficit of approximately \$600 billion.

Table 10.

Metalworking machine-tools owned by U.S. Department of Defense, 1953-1983
(thousands)

	Machine-tools	Percent of total
1983	63	2.9
1973	102	3.3
1968	130	4
1963	255	8
1958	270	12
1953	440	18
1949	NA	13
1945	NA	33

Source: 7th through 13th American Machinist Inventory of Metalworking Equipment.

Table 9 presents a gross bill of materials for the production of the 10 million machine-tool requirement. We at present do not have the excess capacity to produce the materials required, in particular, iron and steel. Note further that, calculated on an average annual production basis, the number of machine-tools required to produce the 10 million new ones, exceeds the current inventory of tools under 10 years old. Clearly, it is "impossible" to invest \$600 billion in machine-tools over the next year. However, this demonstrates a second point.

While initially, the program to rebuild our capital-goods sector to supply the defense mobilization, will rely on existing technology, we must as fast as possible introduce laser and particle beam machining technologies at all levels of critical production. In fact, *we must force them in*. The President must direct the Defense Department to *require* wherever a significant advance in productivity would be achieved, that defense goods be produced with laser machining. As LaRouche recently wrote in *EIR*: May 14, 1985, "The continuing hoax of 'artificial intelligence': the multi-billion dollar boondoggle".

All advances in technology, and of potential relative population-density, occur principally as technological advances in qualities of producers' goods, in an increasingly energy-intensive and capital-intensive mode of alteration of basic economic infrastructure and workplaces. The source of these advances in technology is the improved power of the individual human mind, to generate and to assimilate efficiently new conceptions flowing from fundamental scientific progress.

Viewed from this standpoint, the calculated \$600 billion investment deficit figure is a fiction of the current level of technology of U.S. capital-goods industries. Once we get this mobilization off the ground, the revival in scale of U.S. industry, and the technological advances it will force through, will result in so cheapening the cost of production as to make the \$600 billion figure almost irrelevant.