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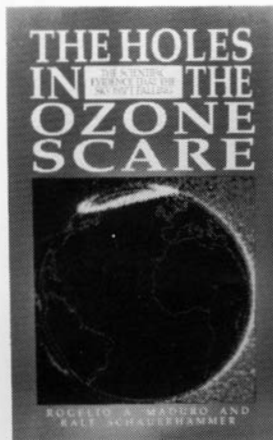
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From the Editor

During the 15th century European Renaissance, the Epiphany—the Jan. 6 feast celebrating the visit of the Biblical “wise men” to the newborn Christ Child—was often depicted with three kings who stood for all ages and all known continents of humanity. The old king embodied the wisdom of experience; the middle-aged one, the reasonableness of maturity; the young king, the enthusiasm of youth. One king was often shown as European, a second as Asian in appearance and attire. The Black African was always the youngest king.

As in those pictures, today Africa stands for youth—endangered and full of promise. This issue, which begins *EIR*'s 20th year of publication, is dedicated to the millions of Africans and other young people who have been born since New Solidarity International Press Service first appeared as a weekly newsletter in 1973, and later evolved into *Executive Intelligence Review* magazine. But the contents are intended also for those who are not African, or who may not believe they have to make decisions about Africa.

Africa is also a metaphor for the situation confronting the whole world. There is no stable power center in Washington, Moscow, or anywhere else. The incoming Clinton administration is a loose amalgam of contending impulses. The President's controllers will support now one, now another competing policy. It will be a transitional presidency, where everyone will get a little reward—a rainbow coalition, where everyone gets to sparkle for five minutes before he or she is shoved out the door.

In Moscow, harsh winds are blowing. Why are there no economic solutions? Why do the Russians make strong revolutionary moves in one direction, and then forces coalesce to make equally strong counter-revolutionary moves in the opposite direction? These abrupt and violent changes are the result of a culture which lacks the concept of *imago viva Dei*. Russian history is a history of tyranny and counter-tyranny. Japan, as well, is dominated by a collectivist conception of man.

The survival of Lyndon LaRouche's political movement is one of the miracles of our era. As the year ends, LaRouche's enemies are on trial in Alexandria, Virginia, the same court where he was unjustly convicted four years ago. Whatever the outcome of the trial, the evidence of their evil deeds is on the record of history forever. Therein, lies one of the great hopes in 1993.

Nora Hamerman

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Africa's Crisis Today

4 Industrialize Africa to ensure world's future

The crisis facing Africa today need never have occurred; it was the direct result of a malthusian and colonialist policy. Now, the challenge of repairing that damage and helping the continent to flourish, as it certainly could, is a moral litmus test for mankind.

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Industrialize Africa to ensure world's future

by Nancy Spannaus

As we enter 1993, the continent of Africa has come into the center of public attention. As a result of the decision by the Bush administration to send tens of thousands of troops to escort relief convoys in famine-wracked Somalia, the debate over why Africa has come to this pass, and how to solve its crying needs, dominates the world's agenda. Some imperialists openly call for recolonization and protectorates, while other voices denounce the deployment as having contemptible geopolitical purposes, or, alternatively, oppose putting any resources into Africa at all.

Within this debate, *EIR* shares with many others the belief that Africa represents the moral test for the success of our civilization. If the world's citizens cannot muster the moral, political, and economic means to foster the economic development of Africa as a continent of sovereign nations, not colonies, in which all human beings live lives of sovereign dignity, then we will have proven ourselves unfit to survive. In fact, our failure to meet this test will likely result in the physical destruction of not just Africa, but the world of nations.

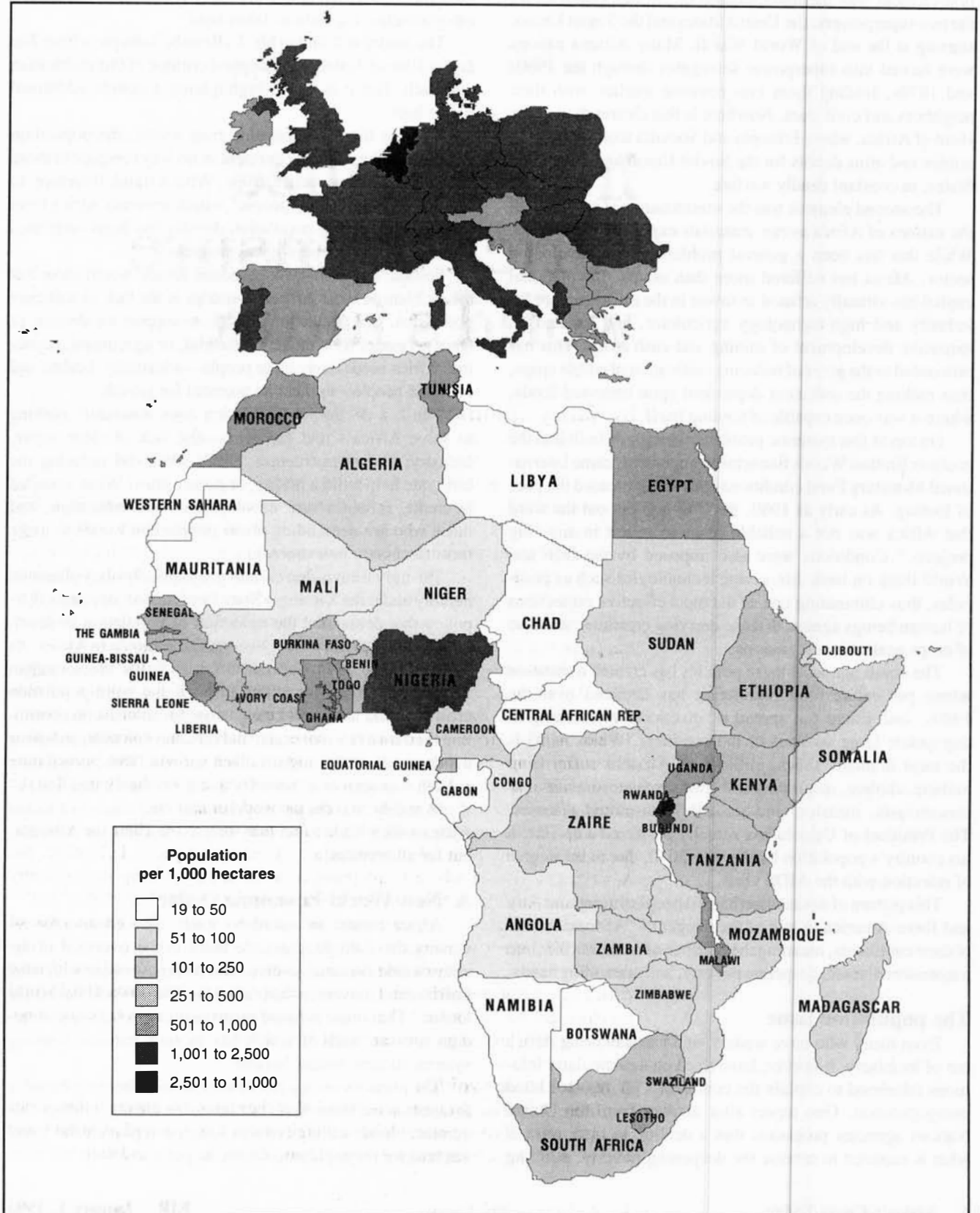
EIR's unique role has to do with the fact that we are the chief international publication of the political movement associated with Lyndon LaRouche, the American economist whose breakthroughs in the science of physical economy provide the only viable basis for the rebirth of Africa. We have assembled in this issue the core materials for statesmen and citizens for dealing with the issue of Africa. We present an overview of the looting process that has brought the continent to the abyss, a survey of longstanding development projects available to make Africa a center of prosperity, and a major conceptual contribution on Third World development by LaRouche. The evidence is compelling: The disaster need not have occurred, and all the tools are available for reversing it.

A model to be avoided

There should be no question in the mind of the reasonable observer that Africa is potentially a thriving place. It has a surfeit of raw materials and plentiful water resources, if they are developed. It has abundant arable land, and until recently,

FIGURE 1

Africa's population density is very low compared to most of Europe



a healthy, growing, young population. One is justified in asking the question: What went wrong?

The answer is a devastating documentary of evil. The first element was the manipulation of various countries by the two superpowers, the United States and the Soviet Union, starting at the end of World War II. Many African nations were turned into superpower surrogates through the 1960s and 1970s, leading them into constant warfare with their neighbors and civil wars. Nowhere is this clearer than in the Horn of Africa, where Ethiopia and Somalia took turns being armies and arms depots for the Soviet Union and the United States, in constant deadly warfare.

The second element was the maintenance of virtually all the nations of Africa as raw materials exporting economies. While this has been a general problem of the developing sector, Africa has suffered more than others. International capital has virtually refused to invest in the infrastructure for industry and high-technology agriculture, and insisted on extensive development of mining and cash crops. This has proceeded to the point of reducing cultivation of edible crops, thus making the continent dependent upon imported foods, where it was once capable of feeding itself.

On top of this systemic problem, which was built into the postwar Bretton Woods financial arrangement, came International Monetary Fund conditionalities that increased the pace of looting. As early as 1980, the IMF had put out the word that Africa was not a suitable place to invest in any "big projects." Conditions were also imposed by the IMF and World Bank on basic life-saving technologies such as pesticides, thus eliminating one of the most effective protections of human beings against disease-carrying creatures, and also of crops against locust swarms.

The combination of these policies has created a situation where per capita food production has declined over the 1980s, and where the spread of disease is threatening to depopulate large sections of the continent. While AIDS is the most dramatic killer, millions of Africans suffer from malaria, cholera, respiratory infections, schistosomiasis, onchocerciasis, measles, and sexually transmitted diseases. The President of Uganda has actually projected a decline in his country's population by the year 2010, due to the degree of infection with the AIDS virus.

This picture of devastation has led people throughout Asia and Ibero-America to talk of the danger of "Africanization" of their continents, meaning the collapse of economic life into a morass of disease, desperate poverty, and marauding bands.

The population issue

Even many who have wished, and tried, to bring Africa out of its misery, however, have fixed on a particularly infamous falsehood to explain the continent's plight—so-called overpopulation. One report after another from the United Nations agencies proclaims that a decline in birth rates is what is required to reverse the deepening poverty, pointing

to the high per capita birth rate in certain African nations.

This refrain can be expected to reach an even higher pitch next year, as the U.N. prepares for its next Population Conference in 1994, and as the implementation of the U.N.'s environmental regulations takes hold.

The reader will find in Mr. LaRouche's chapters from *The Lagos Plan of Action*, a conceptual critique of this malthusian approach. But it is worth highlighting a couple additional points here.

First, as the accompanying map shows, the population densities of the African continent in no way compare to those of industrialized western Europe. What a fraud, therefore, to say that it is "too many people" which prevents Africa from thriving. Increasing population density has been correlated historically with technological progress.

Second, any competent economic review would show that the problem in most African countries is the lack of sufficient population, and population density, to support the division of labor necessary for a modern industrial, or agricultural, economy. Africa needs many more people—admittedly, healthy and educated people—to meet its potential for growth.

Third, a decline in population does absolutely nothing to solve Africa's real problems—the lack of clean water, industry, and infrastructure. Since when did reducing the birth rate help build a bridge, or power lines? What's needed is credit, infrastructure development, and education, and those who are demanding fewer people don't want to make those necessary investments.

The ugly truth is that certain geopolitical policy planners, notably under the Kissinger State Department, devised a U.S. policy that demanded the reduction of population in developing countries, including Nigeria and Ethiopia in Africa. As outlined in the 1974 National Security Study Memorandum 200 (NSSM 200), this policy insisted that rapid population growth would lead developing countries to insist on controlling their own raw materials, and thus become independent of the demands of the industrialized nations. Thus, population growth was seen as a "security threat" to the United States.

In reality, it is the poverty, disease, and chaos in a looted Africa which leads to security threats, not just for Africans, but for all mankind.

A 'New World Economic Order'

Africa cannot be saved by itself. The context for reversing the outright genocide there is the overhaul of the entire world financial system, and its replacement with what LaRouche's movement has called the "New World Economic Order." That order is based on arrangements between sovereign nations, each of which has its own national banking system, to their mutual benefit.

The plans for such a just new order have been on the table for quite some time. With our intensive efforts, perhaps this current, bloodcurdling crisis in Africa will provide the moral impetus for these plans to finally be put into effect.

1990s decade: breaking point for the IMF or for Africa?

by Linda de Hoyos

In his December 1987 encyclical *Sollicitudo Rei Socialis*, Pope John Paul II identified as “structures of sin” the prevailing attitude and policy toward developing countries. These structures, he said, “were radically opposed to peace and development, for development, in the familiar expression of Pope Paul’s encyclical, is the ‘new name for peace.’ ” The gigantic contradiction today between the tremendous productive capacity of the continent of Africa and the terrible misery of its malnourished citizens is precisely the result of such “structures of sin,” which lie “hidden behind certain decisions, apparently inspired only by economics or politics.”

The International Monetary Fund, enforcer of the demands of the international creditor banks, stands at the center of the “structures of sin” which are depopulating the African continent. The consistent denial of the means of development, not only for industrialization but even for agriculture, has been the theme of IMF policy toward Africa since the creation of the 1944 Bretton Woods system. A profile of Africa’s trade illustrates the point.

In 1990, Africa accounted for only 1% of total world trade annually, down from 3.8% in 1970. As *EIR* economist Anthony Wikrent has reported, in 1988, ninety-five percent of all U.S. imports from Africa were raw materials. However, the United States did import 494,786 tons of iron and steel from Africa in that year, while exporting only 20,936 tons of steel—20 times less—back to the continent. To a continent starved for capital goods, in 1988, the United States shipped only 35,796 tons of “machinery for specialized industry”—the equivalent of one small shipload; only 3,373 tons of “general industrial machinery and equipment”; and only 180 tons of “power-generating machinery”—equivalent to one single turbine generator.

However, preserving Africa as a gigantic slave plantation, half of U.S. exports to Africa were cereal and cereal products. This is required by the fact that over the last 20 years, most African countries have become increasingly unable to achieve levels of food self-sufficiency, which renders them powerless to buck the “structures of sin” operating against them. Secondly, the U.S. exported 20,936 tons of used clothing (hand-me-downs from the big house) to Africa—in the case of Ghana and other countries, wiping out indigenous textile industries.

In the decade of 1980 to 1990, the terms of trade for

African commodities decreased by 66% and most African countries suffered successive currency devaluations, making Africa a bargain-basement for the OECD nations.

This perverted trade profile is the direct result of the policy of IMF conditionalities imposed on the African nations over the last 30 years. The corruption of various African leaders is itself not the cause of Africa’s penury, as depicted in the western press. Corruption is a de facto conditionality of the IMF. African leaders are forced to implement measures conducive to capital flight and reverse capital flow; the money siphoned off to their own pockets is banked in the North.

Over the last 10 years, under IMF structural adjustment programs, African countries have become increasingly contracted; with the most notable case being Nigeria, where per capita income fell 75% from 1986 to 1990. The escalating levels of looting from Africa will reach a breaking point in the decade of the 1990s. Either the IMF and the bankrupt monetary system behind it are overturned for a new international monetary system dedicated to development, or the levels of economic devastation will soon result in the political disintegration of the African nations—Somalia. The latter case puts Africa on the road to formal recolonization, as United Nations Secretary General Boutros Boutros-Ghali demands that a U.N. administration and trusteeship be placed over the broken nation of Somalia.

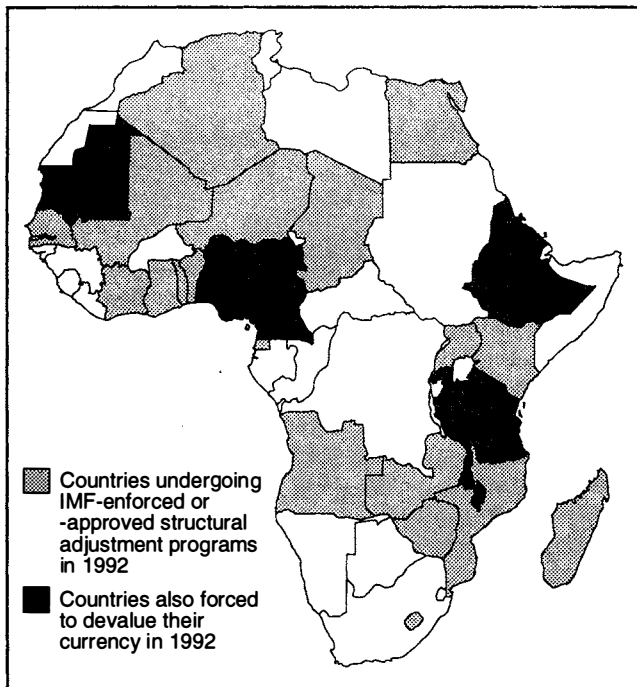
Mechanisms for disintegration

The accompanying maps chart the phases of a process by which the African nations are being destroyed today.

Figures 1 and 2 show the level to which Africa is today a proprietary of the IMF. Even those countries not directly under IMF control, such as South Africa, in general are carrying out measures coherent with IMF conditionalities. Despite the level of capital extracted from Africa, with the exceptions of Egypt and Sudan, the ratio of debt service to export earnings has risen in all cases since 1970. Even countries like Somalia and Ethiopia, despite war and famine, have been paying more than 30% of their export earnings to the debt.

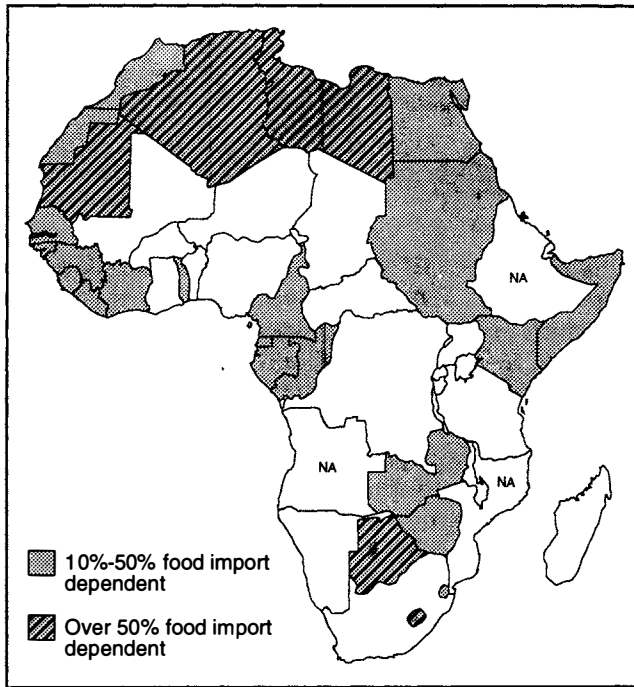
Figure 3 shows Africa’s extreme food vulnerability. As debt and debt service rise, food security decreases. This is the result both of forcing countries to grow cash crops for export to pay the debt and of import liberalization, whereby countries are flooded with cheap grains. Food is then a weap-

FIGURE 1
Countries under IMF rule in 1992



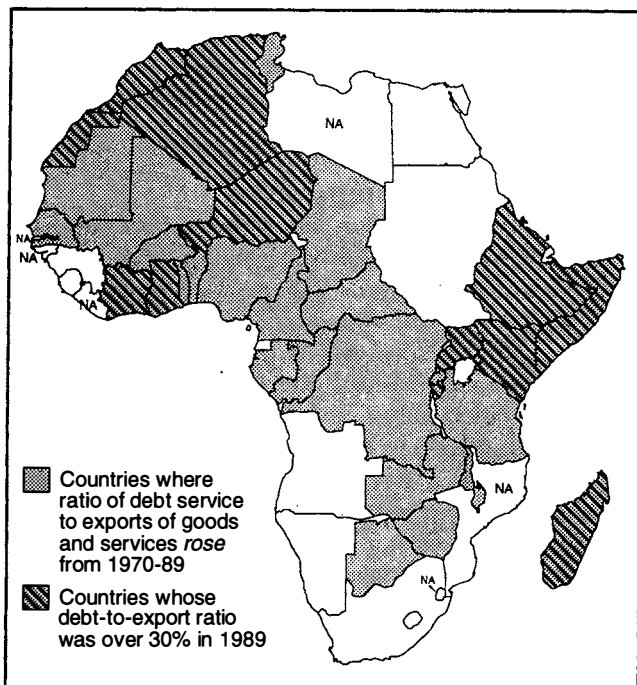
Source: *EIR*.

FIGURE 3
Africa's food import dependency in 1988



Source: UNDP.

FIGURE 2
Debt service-to-export ratios in 1989



Source: UNDP.

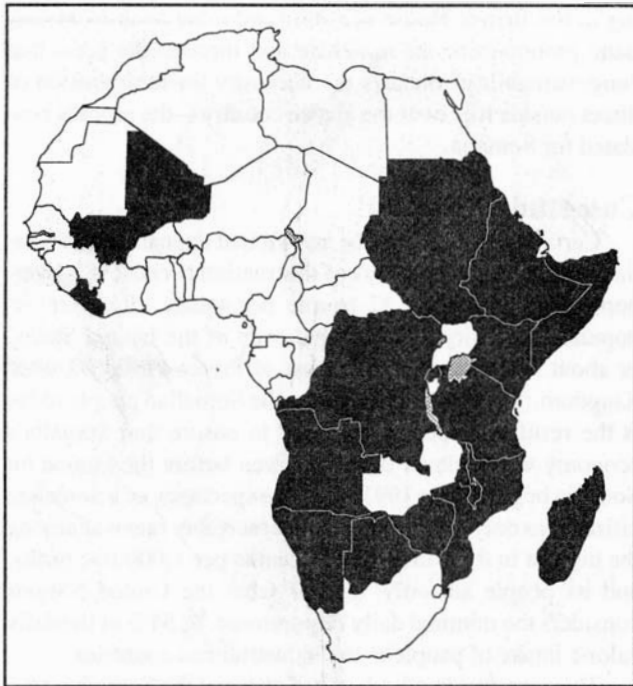
on in the hands of the OECD nations, to enforce adherence to IMF policies.

The precarious food situation leads to catastrophe, if a natural disaster occurs, as **Figure 4** shows. Lack of irrigation means total dependence on rainfed agriculture. With no buffer stocks, this year's drought—the worst in the century—led to famine throughout Africa, with 40 million people threatened by starvation, according to the U.N. Food and Agriculture Organization (FAO). The starvation deaths throughout eastern and southern Africa this year were given little publicity in the western press, in comparison to Somalia, because there is no issue of national sovereignty in aid delivery. There is no figure for the deaths suffered by famine in these other areas of Africa.

In 1974, an *EIR* study concluded that if IMF conditionalities were not halted, Africa would face "biological holocaust" by the mid-1980s, with the onset of epidemics, including of diseases not yet known. *EIR*'s prognosis was borne out by the AIDS epidemic in Africa (**Figure 5**). AIDS is now boosting adult death rates in many African countries, wiping out the productive labor force. The HIV virus is triggered into action by co-factors that also act to suppress the immune system, such as Protein Energy Malnutrition, suffered by many Africans, and chronic malaria, which now afflicts more than 200 million Africans.

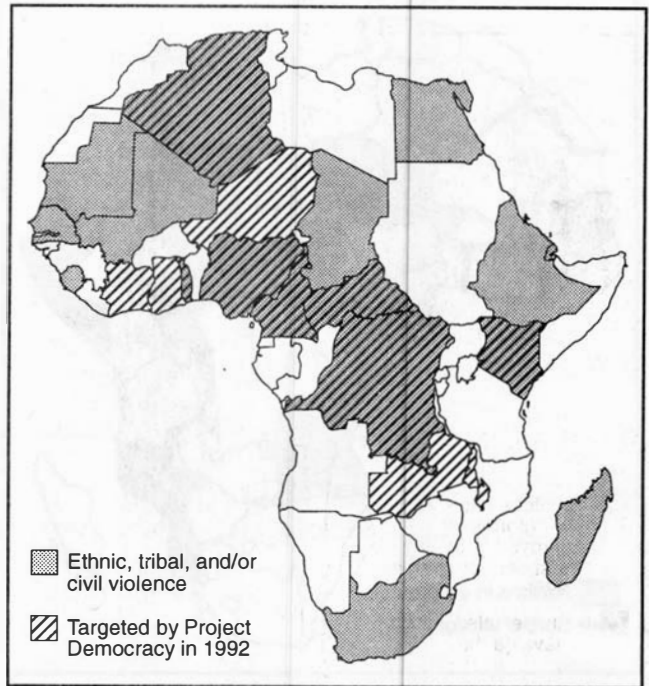
The final kick to the African countries has been the An-

FIGURE 4
African countries afflicted with famine in 1992



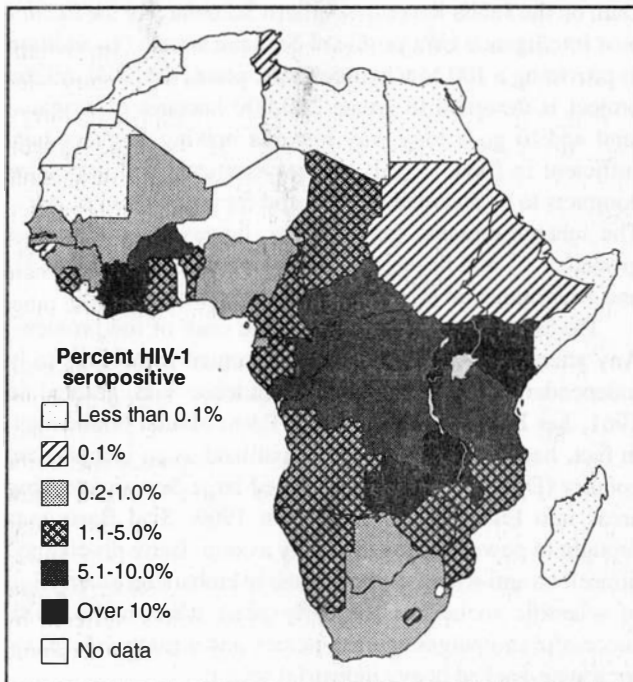
Source: FAO.

FIGURE 6
Ethnic and tribal violence in 1992



Source: EIR.

FIGURE 5
AIDS prevalence in Africa



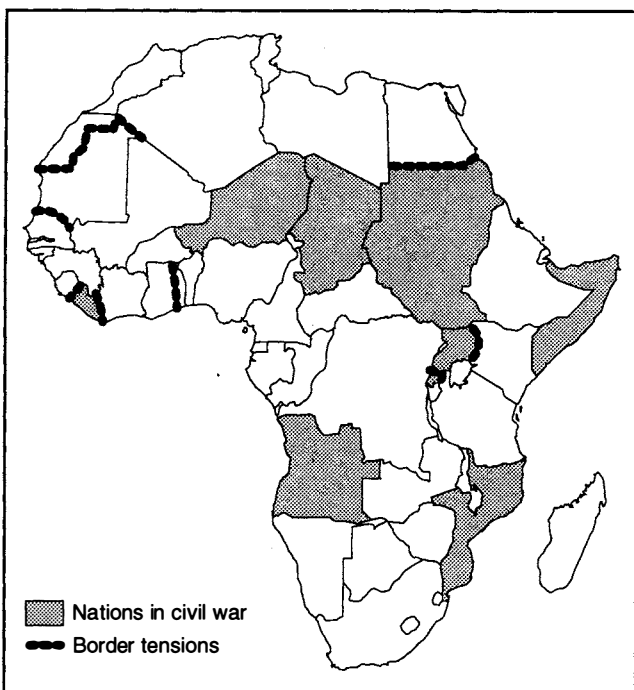
Source: U.S. Census Bureau.

glo-American crusade “Project Democracy.” The demand for “democracy” has become the formula for cutting aid to recalcitrant nations, or for fomenting destabilization and ethnic and tribal warfare against the central government (Figures 6 and 7). As is seen in Somalia, the support offered by Washington or London to the opposition is enough only to destroy the incumbent regime; nothing is offered to establish a viable alternative.

In 1992, Kenya, bordering destroyed Somalia, has become a target of choice for the democratizers. Aid was cut to Kenya this year (but restored in September) due to U.S. complaints that President Daniel arap Moi was not carrying out democratic reforms. In August, Kenya faced internal famine due to drought, on top of inundation by starved Somali and Sudanese refugees. This human disaster did not stop 103 U.S. congressmen from sending a letter to Moi to voice their dissatisfaction with the “pace of reform” in Kenya.

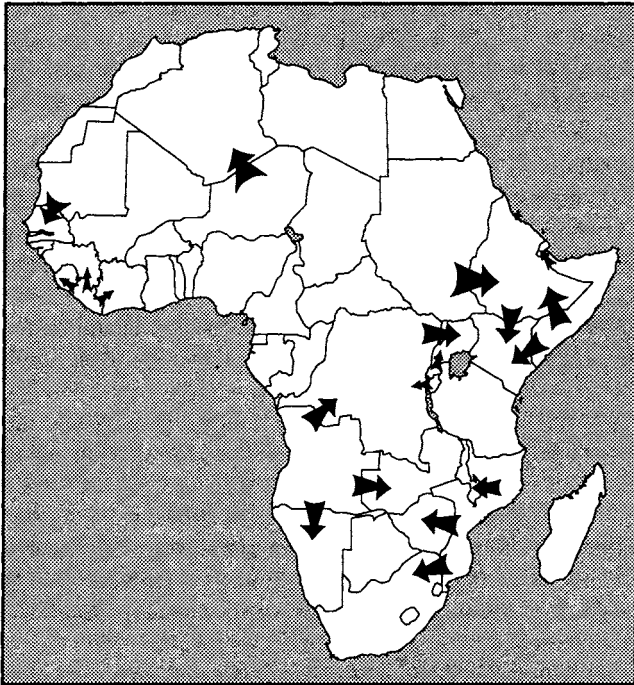
As in Somalia and Zaire over the last year, outbreaks of ethnic or civil violence are the *coup de grace* for the fragile productive economies of Africa, destroying what little infrastructure exists. Flows of refugees signify the total disruption of economic life, not only for the war-torn country but often in the host countries (Figure 8). In Somalia, 4.5 million people have been displaced, out of a total population of not more than 7.5 million. The proxy wars fomented in Angola and South Africa serve the same genocidal purpose. It is

FIGURE 7
War in Africa during 1992



Source: EIR.

FIGURE 8
Refugee flows in Africa during 1992



Source: EIR.

estimated that 900,000 Mozambicans have died in the civil war there, and another 6 million have been displaced.

As conditions of chaos and disintegration are fostered throughout the continent, the powers behind the IMF, dwelling in the British House of Lords and other such locations, issue pronouncements in debate and through the press that “ungovernability” dictates the necessity for reimposition of direct outside rule over the victim country—the process now slated for Somalia.

Case study: Somalia

Certainly, it could not be argued that the nation of Somalia is suffering the torments of destruction because it is overpopulated. With only 12 people per square kilometer, its population density is below that even of the United States, or about 200 times less than that of Prince Philip’s United Kingdom. The catastrophe facing the Somalian people today is the result of a policy designed to ensure that Somalia’s economy would never develop. Even before the famine hit Somalia beginning in 1991, the life expectancy of a Somalian citizen was only 48 years; its infant mortality rate was among the highest in the world, at 128 deaths per 1,000 live births; and its people ate only 73% of what the United Nations considers the minimal daily requirement, or 54% of the daily caloric intake of people in the industrialized countries.

This was the already-depleted status of the Somalian people, when the U.S. government, with the cooperation of the European Community countries, pulled the plug on the government of Siad Barre in January 1991, at the same time that Washington had unleashed its war against Somalian ally Iraq.

The Israeli- and U.S.-backed war against Barre also brought to a halt plans for the construction of the Baardeere Dam on the Jubba River in southern Somalia. As the *Economist* Intelligence Unit profile of Somalia stated: “In addition to providing a 100 Mw hydroelectric plant, the \$780 million project is designed to create 240,000 hectares of irrigated land and to go a long way towards making Somalia self-sufficient in food. . . . It [the government] had hoped for contracts to be awarded in 1991 and for completion in 1995. The scheme remains controversial, however, both on cost grounds . . . and because of its potential socioeconomic [!] and environmental [!] impact on the region.”

The Baardeere Dam points to the crux of the problem. Any attempt by the Somalian government to become truly independent after nominal independence was granted in 1961, has been quickly crushed. Post-colonial boundaries, in fact, had hived off French Somaliland as an independent country (Djibouti), and incorporated large Somali-speaking areas into Ethiopia and Kenya. In 1969, Siad Barre was brought to power in Mogadishu by a coup. Barre proclaimed himself an anti-tribalist who wanted to embark on a campaign of scientific socialism. His early years were marked with successful campaigns against literacy and unsuccessful plans for a state-backed heavy industrial sector.

In 1974, any progress that Somalia had gained was largely

wiped out with the major drought of that year, in which millions across the Sahel region of northern Africa died. In 1977, Somalia, with Soviet encouragement, went to war to win the Somali-speaking Ogaden region from Ethiopia. By November 1977, Moscow suddenly switched tracks and refused to support the Somalia war effort. As Somalia maintained a two-year guerrilla war with Ethiopia, drought struck again. Over the years of 1978-80, the Somalian economy began to suffer a net decline, and current accounts deficits bulged.

1981: Enter the International Monetary Fund. The government was forced by the Fund to create a dual exchange rate and take standard measures for an IMF "recovery"—import liberalization, cutting back of public sector spending, and so forth. But as the *Economist* explains: "The recovery was thrown off balance by a new financial crisis in 1984 caused by drought and the imposition of a ban on Somalia's livestock by Saudi Arabia, thus cutting off by far the largest source of export earnings." The Saudi ban had been imposed due to rumors of rinderpest among the Somali livestock, and the ban has persisted even to now, despite certification from the FAO and the International Epizootics Organization that rinderpest is not present.

But in 1984, Somalia balked at IMF demands that it devalue its currency; impose price controls, and cut the deficit. As the current account deficit grew, Somalia was forced to go back to the IMF in 1985. The IMF imposed a devaluation, the floating of the exchange rate, an end to trade restrictions, and constriction of the money supply. But no new money was forthcoming from the Fund, because of back debt owed.

Although a stand-by credit facility was negotiated in 1987, Somalia broke with the IMF that year, by suspending its foreign exchange auctions. The IMF stopped its lending to Somalia. All other creditors followed suit. In effect, sanctions were placed on Somalia. As the *Economist* described it: "Shopkeepers cleared their shelves in Mogadishu, and industrial output trailed off due to shortages of raw materials and spare parts, forcing the government back to the negotiating table." The industrial sector, never more than 5% of GDP, was operating at only 19% of capacity by the end of 1987.

By the end of 1988, Somalia was forced to impose a new structural adjustment program, this time under the aegis of the World Bank, but with no new funds coming either from the Fund or the creditor banks. "Indeed," as the *Economist* relates it, "donors and investors have kept their distance as Somalia disintegrated politically."

Under the IMF and World Bank, despite the ruin of the economy, in 1989, Somalia paid a full 47.6% of its export earnings to debt service!

Between 1987 and 1989, the currency was devalued by 460%. The devaluations raised the price of imported goods and food, which as the *Economist* noted, was "a trend accelerated by the drought of 1984 and the removal of government price controls under pressure from the IMF." In February 1988, the government intervened to reimpose price controls on basic foodstuffs. This move fostered the creation of a

black market, and in June 1988, under world pressure, the government took off the controls, with the result that food prices soared 200%.

Countdown to the death of a nation

In 1989, with the Somalian economy reeling under the effects of both the IMF program and the punishment suffered if it tried to buck IMF demands, opposition forces began to gather strength, backed by the capitals of the creditor countries.

In 1989, the United States stopped all aid to Somalia, citing human rights violations of the Barre government.

In 1990, the IMF imposed a new 500% devaluation of the Somali shilling, sounding the death knell of the country's economy.

Conferences of the opposition to Barre were called in Rome and elsewhere, but despite evidence that Israel, through Ethiopian channels, funded the United Somali Congress, which stormed Mogadishu in January 1991, the countries of the West pulled up stakes once Barre had been overthrown. Embassies were shut down. The United Nations made its exit.

In December 1990, all commercial imports of food aid were ended.

In short, the western countries acted to end the Barre regime, only to bring in the gang of clan warlords waiting. If Washington, London, Paris, or Rome had had any other intention than to destroy Somalia, then food, aid, and credit would have been available to the forces who brought down Barre. But, under conditions of extreme internal division, *the economic basis for any viable government continued to be denied.*

The result is that which we see in the front pages of the newspapers—mothers, distracted by hunger and madness, watching their hollow-eyed children die before their eyes. At the height of the crisis, United Nations special envoy Mohammed Sahnoun reported from Somalia that between 4,000 to 5,000 children were dying each day from malnutrition and resultant illnesses.

The secondary result is that Somalia has become the new precedent for the full abrogation of sovereignty by the United Nations, as U.N. Secretary General Boutros-Ghali demands that all Somali citizens must be disarmed in preparation for the government to be placed under U.N. one-world administration and trusteeship.

Somalia is to become a colony once again. When the British left Africa in the 1960s, life expectancy in many countries was 28..

As one leading fighter of the British-IMF system of colonialization, Mohandas K. Gandhi, stated in 1922: "I have undergone a complete transformation in my attitude towards the system of government under which we are laboring. To me, it is satanic."

In 1993, the IMF and the "structures of sin" it upholds must go.

Immediate relief needs for Somalia

by Marcia Merry

The following is a checklist of immediate relief requirements to be met in Somalia as of December 1992. It covers the needs of day-to-day life, and progress in meeting these needs. Most of these emergency measures are interdependent. For example, as soon as water, shelter, and security can be provided, centers providing cooked food could be shut down, in favor of distributing foodstuffs directly to households and communities, and then restoring and expanding food output potential. The Red Cross estimates that over 75% of the nation's population are dislocated as of year end, and forcing people to trek to feeding stations prolongs the dislocation.

The quantities cited are based on meeting needs for 4 million people. As of mid-December, American Red Cross officials reckoned that 1.5 million Somalis were at risk of starving, and another 3 million (out of a total population of 6 million) were suffering from lack of food. Overall, 95% are malnourished, and 75% suffer severe malnutrition. Therefore, an average of 4 million was taken for calculations purposes.

Emergency measures

Food: As of year end, the flow of emergency food staples required per month for Somalia are: 1,800 metric tons of cereal grain products, 345 metric tons of beans, and 110 metric tons each of oils and milk powder. Additionally, there is need for a quantity (to be determined by nutrition experts) of specially fortified foods for "re-feeding" or "pre-feeding" for the critically malnourished, and infant formula. An example of a "re-feeding" product is "Unimix," a fortified food that can be made from specially milled corn, rice, wheat, or other grain, with oils and other ingredients added for nutrition and easy digestion. Unimix is used for small, frequent meals.

Complete-diet food items, such as meat, fish, dairy and poultry products, fruits, and vegetables must be mobilized for mass-scale provisioning as soon as the sickly are rejuvenated enough for full diets.

The volumes of cereals and other staples are calculated on the guideline factors of daily per person rations of 1 pound of cereal stuffs; 3 ounces of dried beans, peas, or other pulses; 1 ounce of dried milk powder; and about 0.06 pounds of oil or other fat.

Distribution: Providing dry rations to household groups in their own villages and residences at the earliest time must be the objective. As of December 1992, the Red Cross was

operating 900 "wet feeding" stations in the country, serving cooked food for over 1 million people, because they feared that dry staples might be stolen, and also because hundreds of thousands of dislocated people had no means to prepare meals. As of mid-December, 55% of Red Cross relief food was provided in wet rations and 45% in dry form.

Water: Each person requires at least 8 glasses (roughly 2 liters) of safe water a day for drinking, and additional water per capita for basic hygiene, cooking, and other vital functions (on average, another 90 liters). For 4 million dependent Somalis, this means about 106 million gallons a day (400,000 cubic meters) for personal needs. In addition, water must be provided for various public uses (administrative centers, hospitals, and feeding operations) and for livestock and agriculture.

To meet immediate needs, all wells must be freed of debris and river waterworks made right. Necessary volumes of chlorine, alum, and other supplies, portable water purification equipment, such as that used by the U.S. military during the Persian Gulf incursion, and large quantities of rehydration packets are essential.

Logistics/transport: Food relief should be organized on the needed scale in all locations immediately, instead of the slow pace followed by the U.S. deployment in mid-December, proceeding place by place. Rapid delivery can be done by a combination of airlift, sea delivery, and road transport. This ready-on-the-spot approach is also required for vaccines, water treatment equipment, etc. Somalia has two international airports (Mogadishu in the south central area, and Berbera in the north), and five other domestic airfields (Kismayu, Burao, Hargeisa, Alula, and Bosasso). The major seaports are Mogadishu, Berbera, and Kismayu, but other coastal sites can be used for unloading cargo by military logistics methods, for example, the "Ro-Ro" ships, which carry loaded trucks ready to roll-on and roll-off.

Shelter: Housing is required on a mass scale. Red Cross officials estimate that 75% of the population is displaced. Villages and major towns, where over 38% of the population lived, have been destroyed, and thousands of the 70% or more of the population who tended livestock have been impoverished and lost their movable hut homes. The modern German and Japanese spray-concrete construction techniques can be brought to use in the towns and villages, and portable tents and similar emergency housing can be made available to nomadic people as desired.

Public health care: Besides clean water and general sanitation, the basic vaccinations and other public health measures against measles, pertussis, diphtheria, tetanus, polio, and typhoid must be implemented immediately, and measures must be taken to deal with tuberculosis and other afflictions now rampant. Veterinary emergency vaccination and other measures are also required for the flocks and herds. As of mid-December, vaccinations had been administered to 2.5 million sheep and goats, 500,000 camels, and 500,000 cattle

in a program run by the Red Cross, and covering 175 villages.

Medical care: Specialty centers must be set up to provide surgical procedures, and care for chronic and rehabilitation conditions—artificial limbs, etc.

Power: Emergency diesel fuel power, kerosene lighting, and central power systems for the largest towns must be installed or restored nationwide.

Economy: Seeds and livestock herd replenishment are essential to restore output potential of the farming and pastoral economies. Since December 1991, the Red Cross has provided 1,260 metric tons of seed (corn, sorghum, and cow peas) and 18,000 hand tools for the Juba Valley, but much more remains to be done.

Army Corps of Engineers approach

Most of the above emergency measures can potentially be met by the combined efforts of military personnel, especially combat engineers, and the charitable agencies working in Somalia—International Committee of the Red Cross and Red Crescent, the Catholic Relief Services, Save the Children, World Vision, CARE, and a few others.

However, the additional essential relief measures require an Army Corps of Engineers approach to intervene with the infrastructure projects, the education and job training, and restoration of social life and economic activity that will be the foundation for hope and prosperity. The following are the guidelines.

Water projects: The run-off and other available fresh water in Somalia is about 11.5 cubic kilometers, of which only about 7% is made use of. The central water works of Mogadishu, restored to service the week of Dec. 14, must be refurbished, with new hook-ups extended beyond the current reach to properly serve the city. New urban waterworks must also be built in other towns and major centers, with the standard 40-50 year lifespan built in.

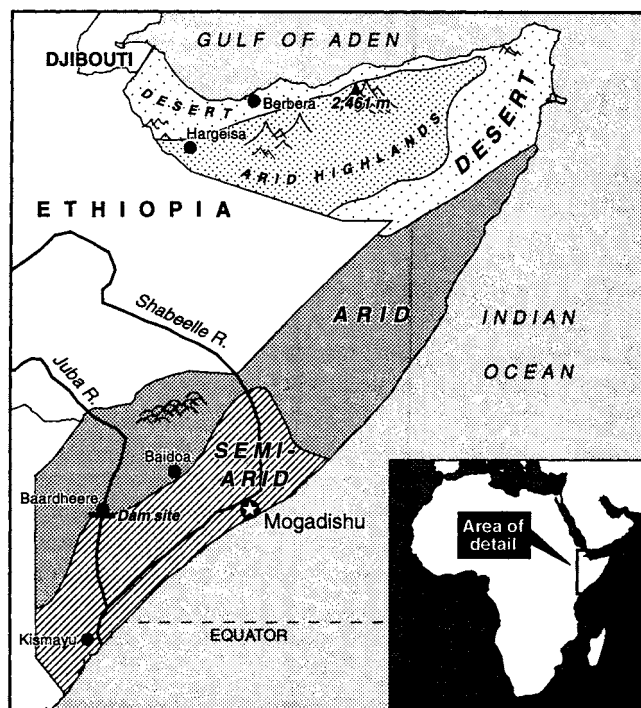
In the northern and western highlands, watering places for livestock (camels, goats, sheep, cattle) must be restored and augmented immediately.

Overall, only 37% of the Somali population (50% urban and 29% rural) had access to safe water as of 1990, even before the present breakdown crisis. Only 18% at that time had access to adequate sanitation facilities (44% urban and 5% rural.) Over 1987-91, it was estimated by Unicef that there was a 78% use rate of oral rehydration treatment among Somali children because of insufficient and contaminated water.

The waterworks centerpiece of the nation should be a strategically located nuclear-powered seawater desalination plant (nuplex) that could provide 100 million gallons a day, and plenty of power for food processing, modern arid-agriculture methods, and other needs.

Agriculture: All the waterworks (valves, channels, catchment areas, pumps) must be restored to use in the Juba-Shabeelle rivers region to allow maximum harvests at the

Somalia: selected physical features



earliest time. With proper water management, this region of the Somali-Ogaden Desert can be transformed into the "Imperial Valley" of Africa, with citrus crops, high-yield grains, vegetables, tropical fruits, and flowers.

Coastal: infrastructure is required for deep-sea shipping, cheap coastal transport, and to provide the basis for a fishing industry. There is a fabulous potential fish catch in the north from the Gulf of Aden. Processing facilities are also needed.

Food processing: and preservation facilities are needed. Plans exist for modern food-irradiation plants that could provide the technology to preserve the meat from the highlands, and ocean catch that could guarantee good diets in the future, with no need for refrigeration.

Inland: transport requires the initiation of the first trans-Somalia rail line, to connect the pastoral highlands, southern irrigated farm regions, and coastal settlements.

Health facilities: A network of primary and secondary health care centers needs to be constructed and up and running as early as possible. As of 1990, on average only 18-30% of Somali children had been immunized by the time they were one year old.

Education: facilities and programs must be made universally available. As of 1990, Unicef estimates of literacy in Somali were 36% for men and 14% for women. An Army Corps of Engineers approach to constructing vital infrastructure provides the opportunity for teaching principles of science and technology in action.



'There is no reason for Africa to be in this crisis'

Mr. Nyanseor is the chairman of the African Anti-Malthusian League of the Schiller Institute, and was formerly president of the Union of Liberian Associations in the Americas. He lives in Atlanta, Georgia. Lawrence Freeman interviewed him on Dec. 22.

EIR: There's a lot in the news these days, about the relief effort that the United States and the U.N. are waging in Somalia. And we have a very acute situation there. But most people probably don't know, that there are many other parts of Africa that are at nearly the same disastrous situation. As a Liberian, you might want to describe to our readers how the situation is in Liberia at this point.

Nyanseor: What is happening on the continent is an age-old problem. Food has always been used as a weapon by the West to destabilize good government that is in the interests of the people. Liberia is a typical example of that. What is happening in Liberia now, is similar to what is happening in Somalia. The situation would have been arrested, had some intervention been done earlier. But perhaps it has something to do with having no interest in people of color, when it comes to their problem in this area. No one has an interest in them.

At this particular time, Charles Taylor came in, and we supported him because we wanted a genuine change, not a change that would be cosmetic. When Charles Taylor came in to unseat Samuel Doe, he had popular support, but later on he had ulterior motives and we did not support him. Charles has been supported by France, Burkina Faso, the Ivory Coast. And what he's doing now, is devastating the country. All the infrastructure has been destroyed, and it's just a matter of time. The Ecomag [military cease-fire monitoring group of the European Community of West African States], the West African forces are still trying to see how they can normalize the situation, but things are worse there. People are starving and dying in the hundreds daily in Liberia, and it seems that no one is paying attention, but focusing on Somalia.

EIR: I understand there's been a huge refugee problem, because, for the last several years, there has been on-and-off-again civil war in Liberia. This amounts to a massive refugee problem, given the relatively small size of the population.

Nyanseor: The neighboring countries are bearing the brunt of the problem, like Nigeria, Sierra Leone, Ghana, the Ivory Coast. They have a lot of refugees, over 200,000 people. There are going to be more than that, and some international relief organizations are doing their best. But it shouldn't have become an emergency. An infusion of food would have helped, but perhaps they felt it was an African problem, and that Africans should help themselves. So most of the western countries did not come to alleviate the problem, so it has become much worse.

So we have a lot of refugee problems. In Monrovia [the Liberian capital], most of the people came from the interior part that has been controlled by Taylor. They fear for their lives, and they have to come to central Monrovia. And we have a water problem, no light, electricity. Malaria is becoming rampant, and people are just dying. There's no medicine. . . .

EIR: The situation in Liberia, like the situation in Somalia and many other African countries, has reached this point because over the past 5 or 10 or more years, what you find is that the United States and other western governments, including the Soviet Union, at one time or another will support one ruler, then arrange for him to be toppled, then come in and support another ruler. There has been a great deal of manipulation in many countries, including Liberia, and then, the only time people find out about it, is when the starving faces are put on the TV sets and on the front pages of the newspapers. But this is very much, it seems to me, a manipulated situation created by the Anglo-Americans, the Soviet Union, and the Israelis.

Nyanseor: Africa as a whole is caught in this Cold War politics. We are a victim of the Cold War politics. Liberia, since its independence in 1847, has always been pro-West. Strangely, the formation of the Organization of African Unity also can attest to that; you have factions within the OAU who wanted the OAU to be non-aligned, in the sense that it should not support anyone in one country; and then you have African countries which say that they want to be in the eastern interests.

So what happens is that, if American interests are at stake, they destabilize that government and install a puppet government. And if the puppet government is infringing on the human rights of the people, they don't care about how they treat their own people. Once their interests have been

served, that's all they're concerned about.

After World War II, those in the African countries who wanted to bring about genuine development—infrastructure development and democratic societies—all those people were killed, because the [foreign interests] didn't want the country to be developed, infrastructurally, or the economy to be developed in a way that it would not be dependent on the periphery, the external forces. The International Monetary Fund [IMF] comes in, the World Bank comes in, and they change the way things are being done.

Nkrumah is one example. He was killed. He was overthrown, because he was preaching nationalism, in the sense that Africa should unite as a federation, that Africa should have a standing military to protect its sovereignty, and Africa should have its own economic community, like the European Economic Community, that sort of thing. The western press took it out of context and made it seem as if Africa was going to go off by itself. That's the problem I think we have.

EIR: You've brought up a couple of interesting points. Concerning the IMF: Many of the African countries were controlled either by colonial powers or by other foreign powers; then some of them became independent, and then they found themselves under the control of the IMF and World Bank. Could you describe how the IMF conditionalities and the structural adjustment programs working together with the international cartels, have destroyed the ability of a country such as Liberia to maintain itself?

Nyanseor: Cheryl Payer wrote a book about the World Bank and the IMF, and one of the things that she highlighted, was that the IMF, alongside the World Bank, has become the chosen instrument for imposing imperialist financial discipline upon poor countries, with a facade of multilateralism and technical competence.

You see, why one of the purposes for the formation of the IMF, was to prevent devaluation. What it did was to give the devaluated countries' exports an unfair price advantage. . . . It will tell you that it's bringing in conditionalities, that you have to cut your health services, you have to cut education services, you have to cut infrastructure development, all this, just to service your debt. And when you do that, you create a serious problem internally. Because in most African or Third World countries, the government is the sole employer. The government in most countries may employ 70-80% of the people.

Now if the government is going to do such a thing, then who is going to provide for all these people? This is one of the problems that we have on the continent. And in so doing, the IMF also will try to supervise the way the government should be run; it will supervise how you manage your money. In Liberia, on two occasions, the IMF has sent people to supervise our Finance Ministry, to tell us how to run our government, what to do. And as a result of that, you have serious problems. All these things are not being told to the

western population. They always see the African governments as just incompetent to run their own government or run their own show; but we are being supervised from the extension of a foreign country.

This is just colonialism revived in a new image.

EIR: Liberia has been very rich in rubber production, and yet the country has been denied the ability to actually use that rubber. So you have a very clear case of direct colonial exploitation of the rubber production in Liberia. Could you tell us more about that?

Nyanseor: Firestone established its plantation in 1926 in Liberia. It was not an investment in the interests of the Liberian people. You remember, during World War II, Great Britain had the monopoly over rubber in the Philippines; they had a lot of plantations. But during the war, they inflated the price of rubber, because the Americans were using it for their war matériel. I think the American government felt very angry about the situation, so they talked to Harvey Firestone, to find somewhere where they could plant rubber.

Liberia was chosen because, after all, it was a colony of the United States. I strongly feel that America has always thought of Liberia as a colony of the United States. So they decided to farm somewhere in Liberia. And the money with which it was done, was forced upon the leadership, because they needed that money to do some work in the country. So, Harvey Firestone used the Liberian government. The government gave Liberia its first loan during World War II, about \$99 million, because of the fertile land for rubber planting. People were earning slave wages, that is, somebody would work for about 45¢ to \$1.25 a day planting rubber. The government had to use forced labor, because the people who had their own farms, planted rice; they uprooted these people to go and work on the plantations for slave wages.

One of the striking things about the western way of seeing development, bringing people into the money economy, is that what it did, instead of building the factories to manufacture the finished product—the same thing they're doing now by moving Americans' jobs across the border to Mexico where labor is cheaper—is that the latex that is taken from the tree [is sent abroad, to where they choose] to manufacture the rubber, then the rubber product, the tire, would be brought back to Liberia and sold with a 1,000% markup.

For instance, you buy a tire here, and we provide the latex for the tires, for the rubber. You buy tires for \$35; we buy tires for almost \$200—for one tire. The common person cannot afford this. And that's how Africa comes to be underdeveloped, where the countries are sucking the resources out of our country.

Africa has had no reason to be where it is today, if it had genuine development on the continent, development of infrastructure.

An 18-year fight to save Africa from catastrophe

For nearly 18 years, Lyndon LaRouche and his associates and collaborators around the world have documented the genocide targeting Africa, and fought to restore the most basic human rights to that continent. What follows are highlights of those efforts.

Summer 1974. LaRouche convened a task force to study the implications of the International Monetary Fund decimation of the African population. The task force, which ran an intensive study from Labor Day to Christmas, reported its preliminary findings to the founding conference of the Fusion Energy Foundation on Nov. 23, 1974: "We forecast at that time," reported task force leader Warren Hamerman, "that, given the policies then being implemented by the IMF and World Bank to slash the food and energy consumption of the world's population, a *global ecological holocaust* would be the inevitable consequence."

April 1975. Returning from a visit to Iraq, LaRouche proposed at press conferences in Bonn and Rome, the establishment of an International Development Bank, which he said should replace the IMF. In written form, the proposal was circulated to almost every government in the world. One of the "great projects" which such a bank should immediately take up, emphasized LaRouche, would be the development of the West African Savanna-Sudan-Sahel region, a potential breadbasket of Africa.

May 1978. The U.S. Fusion Energy Foundation (FEF) sponsored a conference in Washington, D.C., "The Industrial Development of Southern Africa," with participation of several departments of the U.S. government, and several African leaders.

June 1979. An FEF international conference in Paris, "The Industrialization of Africa," was followed by a similar conference in Rome in November. The proceedings of both

were issued as a book under the same title, the next year.

August 1980. Several activists in LaRouche's presidential campaign, led by former Manhattan (New York City) Borough President Hulan Jack, founded the Committee for a New Africa Policy. The committee carried out an extensive campaign for massive short-term aid to Africa, as well as for the longer-term development of infrastructure.

1981. LaRouche issued a book-length commentary on the "Lagos Plan of Action," adopted by the Organization of African Unity in April 1980. Entitled *Stop Club of Rome Genocide in Africa!* the book was designed to remedy certain conceptual flaws in the Lagos plan, to provide a theoretical basis for the continent's rapid development. Two chapters from the book are reprinted on pages 26-57.

October 1982. The Club of Life was founded in Chicago at the behest of Helga Zepp-LaRouche. The founding conference featured several panels on Africa. In November, the Club of Life issued a policy paper, "How the Club of Rome's Food Crisis Can Be Stopped," which highlighted the crisis in Africa.

1983. LaRouche addressed a memorandum to the Non-Aligned Movement, entitled "The Role of a Debtors' Cartel in Bringing President Franklin Roosevelt's Anti-Colonialist Policy into Immediate Actuality."

July 25, 1984. The Club of Life's Africa Commission issued a white paper, "Emergency Measures to Stop the Food Crisis in the Countries of West, Central, East, and Southern Africa."

September 1984. LaRouche's presidential campaign platform included prescriptions for delivering emergency food supplies into the interior of Africa, rather than a few, large food distribution sites to which starving Africans make a virtual "death march." The engineering methods to build roads, bridges, and ports deployed during World War II



Hulan Jack, Helga Zepp-LaRouche, and Lyndon LaRouche in Philadelphia in 1984, during LaRouche's campaign for the presidency. Former Manhattan Borough President Jack was a founding member of the Committee for a New Africa Policy (1980), which launched an international drive for short-term aid to Africa, as well as longer-term development of infrastructure.

should be brought to bear, at the same time that longer-term development is being mapped out.

Jan. 15, 1985. The Schiller Institute organized the first international demonstration in Washington commemorating Martin Luther King's birthday, with 10,000 people calling for defense of the "Inalienable Rights of Man." Demonstrators carried signs demanding, "Export Food, Not Famine; No to IMF Conditionalties," and "Stop Starvation in Africa With American Technology."

May 1985. The FEF magazine *Fusion* published the results of a study on the breakdown of health care in the continent, entitled "Stop the Biological Holocaust: Science Can Still Save Africa."

1985. The National Democratic Policy Committee (NDPC), which represented the LaRouche wing of the Democratic Party, issued a pamphlet entitled "A Certain Difference Between the Great Jesse Owens and the Present Jesse Jackson," written by LaRouche. Discussing Africa at length, he proposed the following development projects.

1) A modern trunk railway across sub-Saharan Africa, from Dakar to Djibouti. This must intersect the existing railway networks, and must pivot upon a leg of the trunk constructed across southern Chad, from the railhead at Maiduguri, in northeastern Nigeria, to the railhead at Nyala, in Sudan.

2) A modern trunk railway link, from the Marrakesh-Casablanca-Oran-Algiers-Tunis system, down to the Dakar-Djibouti trunk system.

3) A modern trunk railway line, extending the Egypt-Sudan system to Lake Victoria ports in Uganda, to Mombasa, and into Tanzania.

4) A comprehensive freshwater management project for West Africa, centered upon the Senegal, Volta, and Niger river systems.

5) Creation of a major catch-basin in Zaire, moving the surplus water into the Chari system in the Central African Republic and Chad.

6) The establishment of a Nile-Victoria water management treaty organization among Egypt, Sudan, Ethiopia, Kenya, Uganda, Zaire, Rwanda, and Burundi.

November 1985. The Schiller Institute commemorated the 1,600th anniversary of St. Augustine's conversion to Christianity with an international conference on "St. Augustine, the Father of European and African Civilization" in Rome, Italy.

April 1986. After meetings by his associates in South Africa with leading black Africans, LaRouche issued a memorandum, "Resolving the Debt/Credit Crisis of Africa." (See page 18.)

January 1988. LaRouche addressed an international conference of the Schiller Institute held in Andover, Massachusetts, on how to replace the defunct Bretton Woods monetary system. Numerous speeches to the conference dealt with proposals to solve the crisis in Africa.

Sept. 3-4, 1988. LaRouche initiated a Food for Peace organizing effort, at a conference in Chicago. Among the resolutions adopted was an emergency resolution to stop the genocide in Sudan: "1) Provide all necessary food to Sudan to prevent mass starvation. 2) Begin emergency spraying programs to wipe out the locust swarms and their breeding areas. 3) Reverse the policy of IMF conditionalities in order to relaunch and complete all necessary water control and irrigation projects, such as the Jonglei Canal project, to ensure that Sudan and the rest of the continent of Africa is never again faced with a holocaust of such magnitude."

Sept. 12, 1991. The Schiller Institute issued a policy paper, *For a True U.N. Fourth Development Decade: A Concrete Solution to the World Economic Breakdown Crisis.*

A proposal to solve Africa's debt crisis

by Lyndon H. LaRouche, Jr.

The memorandum excerpted here was issued under the title "Resolving the Debt/Credit Crisis of Africa," on April 23, 1986, by EIR Nachrichtenagentur GmbH:

According to data compiled by *EIR*, from census-data collected by various international agencies, we have the following 1982 estimated comparisons of certain crucial statistics, for North America (the U.S.A. plus Canada), western Europe, and Africa (**Table 1**).

TABLE 1
Per-hectare development
(1982 estimated comparisons)

	No. America	W. Europe	Africa	So. Africa
Land (million hectares)				
Total	1,834	368	2,957	267
Agriculture (million hectares)	499	151	947	196
Population (millions)	259	343	507	53
Over 15 years old	168	221	242	18
Work force (millions)				
Total	116	146	171	12
Agriculture	2.6	10.6	109	4.3
Industry	36	61	20	3
Infrastructure	0.2	5.5	0.6	0.5
Raw materials	0.1	0.9	0.2	—
Energy produced (trillion kilocalories)				
Total	20	8	5	1
Non-thermal	3.5	2.6	0.2	—
Electricity	2.7	1.6	0.2	0.1
Energy consumed (trillion kilocalories)				
Total	20	12	2.8	0.9

TABLE 2
Africa, internally

	Total	Mediter.	Nigeria	So. Africa	Other
Land (million hectares)					
Total	2,957	500	91	267	2,099
Agriculture	963	93	51	196	623
Population	507	52	85	35	335
Over 15 years old	242	15	44	18	165
Work force (millions)					
Total	171	6.5	32	12	120.5
Agriculture	109	1.6	17	4.3	86.1
Industry	20	1.7	6.9	10	14
Infrastructure	0.6	—	—	0.4	—
Raw materials	0.2	—	—	—	0.2
Energy produced (trillion kilocalories)					
Total	5	1.4	1.0	1	1.6
Non-thermal	0.2	—	—	—	—
Electricity	2.4	0.3	—	1.3	0.8
Energy consumed (trillion kilocalories)					
Total	2.8	0.2	0.3	0.9	1.4

TABLE 3
Population densities
(per 1,000 hectares usable land)

World Average	333.99
North America	233.40
Western Europe	1,025.94
Africa	193.61
Med. Africa	96.80
Nigeria	616.61
South Africa	86.58

Although these comparisons are based on census figures, which have a margin of inherent error, they are sufficiently accurate to illustrate the essential point, and conclusively so. Africa, which has an agricultural area twice that of the United States and Canada combined, and an agricultural work force 40 times that of North America, is starving.

If we deduct three regions of Africa, the Mediterranean region, Nigeria, and South Africa, the picture of the rest of Africa stands out more clearly (**Tables 2 and 3**).

The reason that African food production is so poor, is shown most clearly by comparison of energy consumption

TABLE 4

Per-hectare energy consumption

(1,000 kcal./hectare usable land)

World Average	16,463
North America	42,801
Western Europe (avg.)	89,447
Scandinavia	142,213
Mediterranean	42,851
Other W. Europe	113,879
Africa (avg.)	2,887
Mediterranean	2,673
Nigeria	6,027
South Africa	4,640
China	12,865
North Asia*	500,201

*Chiefly Japan, Taiwan, South Korea

TABLE 5

Energy production and consumption per person

(in 1,000 kcal./person)

	Production	Consumption
World Average	23,494	22,220
North America	77,927	83,900
Western Europe (avg.)	23,219	37,496
Scandinavia	80,770	78,754
Mediterranean	6,078	21,617
Other W. Europe	26,835	41,805
Africa (avg.)	12,521	6,439
Mediterranean	48,323	7,409
Nigeria	14,357	3,797
South Africa	31,669	29,152
North Asia	5,304	24,350

per hectare of usable land area (Table 4).

The foregoing is made clearer, by considering also the comparative figures for energy production per person (Table 5).

The general problem of Africa's economy, is a gross underconsumption of usable energy, both per person and per hectare of usable land. The leading feature of this problem, is a monstrous underproductivity of agriculture. In other words, the only major problem with Africa's economy is a lack of American and European industrial and agricultural technology. In other words, those who propose to limit Africa's eco-

nomie development to so-called "appropriate technologies," are proposing the mass-murder of black Africans through famine and disease. Unless present monetary and economic policies toward Africa are drastically changed, not less than something between 50 and 100 millions Africans will die of the effects of famine and epidemic diseases during the decade or less immediately ahead, perhaps as much as twice that number. Public health measures, headed by adequate diet, safe water for drinking, cooking, and washing, and elementary types of modern sanitation and inoculation, are at the top of the list of rudimentary measures needed to prevent a genocide vastly greater than that suffered under the Nazi regime.

The principal causes for the spread of famine and disease on the present scale, do not originate within Africa itself. The chief causes are those policies of supranational financial institutions and international monetary agencies which have come into being, since 1971, under the IMF's "floating exchange-rate system."

1) African nations' national currencies are forcibly reduced to a fraction of their true value, such that African exports generate much less than a fair level of national incomes, and African imports from industrialized nations are exorbitantly priced.

2) Africa's export markets have been progressively reduced by the North American and European nations' internal policies, of shifting from industrial, to so-called "post-industrial" economies.

3) Especially since 1979, and most drastically since 1982, the external debt of African nations has been pyramided by usurious refinancing terms, externally imposed by international monetary agencies, as "conditionalities" of the IMF and World Bank. The debt-service on this pyramided indebtedness devours not only the African nations' modest export earnings, but also other portions of national incomes.

4) International monetary authorities have used the pretext of certifying a nation's creditworthiness, to impose sweeping "conditionalities" upon governments of African and other nations, and this to the degree that developing nations generally have been reduced to the same state of foreign subjugation which existed prior to independence. Worse, the authors of these "conditionalities" are guided by genocidal, neo-malthusian "population" policies, to the degree that the "conditionalities" imposed by the IMF and other relevant agencies are precalculated to promote accelerated death-rates through the effects of famine and disease.

5) Since early during the 1970s, African nations' dependence upon foreign food subsidies has enabled the relevant foreign governments to control the policies and ministerial appointments of African governments, by threatening to cut desperately needed food supplies should the government fail to comply with certain requirements of governmental policy and composition of government. This mechanism has been used, repeatedly, to force African governments to abandon



Helga Zepp-LaRouche addresses a conference of the Schiller Institute in 1988. With her on the podium is her husband, Lyndon LaRouche (right), and Fred Wills, the former foreign minister of Guyana. Before his death in 1992, Wills was a leader in the fight for a new, just world economic order. In 1976, he spoke before the U.N. General Assembly, demanding a debt moratorium for the most impoverished nations of the Third World. As LaRouche reports in this memorandum, "a few months later, the World Bank forced him into exile from his own nation."

the kinds of developmental policies which might have alleviated the misery of their populations.

6) The most immediate and general need of Africa as a whole, is a combination of large-scale and subsidiary projects in development of basic economic infrastructure: waterways, ports, railways and tributary highways, freshwater management, energy production and distribution, sanitation, and basic urban infrastructure. Over the past 15 years, such projects have been opposed with increasingly efficient vigor, by international banking and monetary authorities. Yet, without those infrastructure-building programs, no significant improvement in agricultural output and industrial development is possible.

7) For various reasons, the optimal, principal source of new energy supplies for most African nations, is nuclear energy, and the development of agro-industrial nuclear-powered complexes (sometimes called "nuplexes") along coasts and major inland waterways. Smaller nuclear-powered generators, in the 100 megawatt or smaller range, are the most general need.

Provided we might assume, that import of European and

North American agricultural and industrial technology might become available, on reasonable terms of trade and financing, the principal remaining obstacles to economic development, are very poor life-expectancies and marginal education.

For example, European levels of technology cannot be employed generally, unless the young are provided a European quality of education through a school-leaving age of 16-18 years, average. It is most difficult to support a new member of society through the first 18 years of life, if the average life-expectancy of surviving infants is in the order of 40 years. European technology requires a life-expectancy in the order of between 60 and 70 years among households of the labor force generally.

This relationship of interdependency, between education and life-expectancies, is twofold. First, since the support of young persons, below 18 years, must come from the physical output of members of the labor force over 18 years, the number of years of productive labor of each member of the labor force, sets a limit on the level of education which can be provided to the young. Also, since the education and later

skills-training of youth constitute an investment by society, the "life of that investment" is of first-rate concern to the economy as a whole. The longer the life-expectancy, the greater the average relative productivity of the labor force as a whole.

Thus, both improvements in quality of nutrition and in public health measures of sanitation and immunization, ought to be among the highest priorities for Africa as a whole.

Can remedies be implemented?

What I have reported thus far, varies very little from what leading Africans and others have stated publicly on many occasions during the past 20 years. This has been emphasized in several conferences of the Non-Aligned Nations, most emphatically at Colombo in 1976, and at Delhi in 1983. What is seldom said publicly, but which desperately needs to be said openly now, is that there is no hope for any part of the continent of Africa, unless there is an early and sweeping overturn of every policy resembling the present and recent policies of the International Monetary Fund and World Bank. Within the setting of the present policies of those institutions, no African government is capable of any economic undertaking which could halt the spread of famine, disease, and bloody social chaos throughout any part of the continent.

As I have indicated, there are measures which could put African nations on an upward course, measures which are objectively feasible, measures which most African governments would approve as desirable options. Without such measures, the situation of the entire continent is much worse than desperate; the situation is utterly hopeless. Yet, no such measures will be allowed in any part of Africa, as long as the current policies of the IMF and World Bank remain in force. A few token measures in such directions might be tolerated by the international monetary authorities, token measures which would have no more effect than a few drops of water in a vast desert.

For the most part, most African governments know this to be true, and yet almost none of them dare to say so publicly. The reason for this, is not properly called cowardice; more than once, governments which challenged the policies of the international bankers and supranational monetary authorities have been overthrown, sometimes bloodily. Courageous leaders have been assassinated; sometimes, members of their families, too. At Colombo, in August 1976, the Non-Aligned Nations bravely resolved policies which would have changed the world very much for the better, but a few weeks later, only one of those leaders dared to support the Colombo resolution openly at the General Session of the United Nations; a few months later, the World Bank forced him into exile from his own nation. When Pakistan's Prime Minister Zulfikar Ali Bhutto attempted to act according to the spirit of the Colombo resolution, Henry Kissinger threatened him, "We will make a horrible example of you, Mr. Bhutto." At Delhi, in 1983, brave and good policies were adopted, but

no one dared attempt to implement the adopted resolutions. These are not cowardly people, certainly Prime Minister Indira Gandhi was no coward; these are political leaders who know that the forces behind the IMF "conditionalities" doctrine are killers, who will overthrow governments, launch waves of assassinations, and even destroy nations, for the sake of defending "conditionalities" doctrines. What can individual African nations' governments do, when much stronger governments are afraid to challenge IMF and World Bank policies openly?

The fact remains, that unless those "conditionalities" policies are overturned, there is no hope for the people of any part of Africa. . . .

If the present "conditionalities" policies are continued, most of the population of Africa will be wiped out by the proverbial "Four Horsemen of the Apocalypse." The threat of infectious disease, is far more menacing, more deadly, than the effects of a thermonuclear war between the superpowers. AIDS, a pandemic infection with a probable 100% rate of fatality, underscores that fact; the fact would be true, although perhaps less immediately so, if AIDS had not erupted.

During the past two decades, governments have submitted to IMF and World Bank "conditionalities," usually on the presumption that by submitting to such demands today, governments would survive until a future time, when the wrongness of the "conditionalities" policies might be generally recognized. The degree of suffering the nation endured because of the "conditionalities" policies, seemed a lesser evil than the bloody chaos which would probably erupt if the nation resisted the "conditionalities." True, governments foresaw that IMF and World Bank policies would lead to murderous ruin during years ahead; one might hope that before that time arrived, the IMF policies would be changed for the better.

Now, yesterday's tomorrow is today. What might have been seen, a few years back, as a ruinous future, is the reality erupting now. The spread of famine and epidemics is proceeding at the gallop; famine and epidemic are becoming as immediate, and more deadly a threat, than the murderous threats of the IMF "conditionalities" backers. Assuming the continuation of "conditionalities" policies, most of Africa has several years, perhaps slightly longer, before the fatal effects of the "conditionalities" policies become irreversible. To that degree, the time for nations to act against "conditionalities" is now or never. . . .

The debt question

The aggregate foreign indebtedness of the developing sector is in the order of \$800 billion and even most of this amount does not involve any net outlays to the debtor nations. Most of this indebtedness was imposed by pyramiding the refinancing of old debts at usurious rates. What the lenders loaned the nation, in recent years, was not money, but a mere bookkeep-

ing entry! If a private lender had engaged in such usurious practices within the United States, prior to 1979, that lender would have been arrested as a "loan shark" and sent to prison with the label of "member of organized crime," as he would have deserved: scarcely the quality of an "honest debt."

This developing-sector debt compares with more than \$10 trillion of debt obligations of industrialized nations, the largest part of that \$10 trillions owed by the United States! The external debt of Africa, is the smallest part of the debt as a whole, and could be simply written off with no great inconvenience to the banking system as a whole.

Presently, virtually the entire international banking system is bankrupt. That is, current liabilities exceed provable current assets by a substantial margin, especially so in the case of the U.S. banking system. By ordinary standards of U.S. law, most U.S. banks are perpetrating a fraud, by continuing to receive and issue credit when they are in fact already bankrupt. In this circumstance, there is only one sensible action to be taken: reorganization in bankruptcy.

If any private firm were as deep in bankruptcy as the international banking system is today, the judge in bankruptcy proceedings would recommend a merciful extinction of the firm, at whatever price sale of its assets would bring at public auction. When entire nations, or their banking systems, are utterly bankrupt, such merciful extinction of the bankrupt entity is not morally permissible. Nations are people; only an Adolf Hitler or his like, would propose to eliminate an entire people as "useless eaters." So, when nations, or their banking systems, go into bankruptcy, we do not liquidate them at auction. We reorganize the nation, to put it on a sound economic footing; in the course of this, we settle its debts at some fraction of the total nominal amounts, a fraction small enough to permit the nation to restore its economy on a self-sufficient financial basis.

Generally, debtor nations prefer to repay the principal value of their debts in full. This is more than merely a noble sentiment; it is very important that the pledged word of a nation be as "good as gold," so to speak. So, we prefer to make arrangements, under which all or much of the future interest payments on past debts are written off, but it is agreed that the total amount due up to the moment of declared bankruptcy will be paid off in full, at some later date. In the case of certain nations, whose debt is essentially a carried-forward debt from an earlier colonial period, in which the nation is wretchedly poor, it is better for all concerned, that the debt simply be written off entirely. In other cases, the nation itself would prefer to make an arrangement to repay all its past indebtedness in full by some future date.

The technicalities of repayment, in such cases, are really quite simple. The debtor nation issues a series of bonds, which it offers in place of its debt to date. By arrangements with relevant governments, the value of these bonds is secured at par value, pending the scheduled date of payment on each bond of the series. By means of this arrangement, the

debtor has replaced the creditor's non-performing financial asset with a valuable asset. The intelligent creditor will gladly accept this arrangement, even though it means that the debtor, instead of not paying the old debt today, will actually pay the same amount some months or years in the future. The creditor might prefer to have payment today, but since that is impossible, the creditor, if he is rational, will realize that the new arrangement is the best possible solution. . . .

. . . Reorganizing the debt is not a major problem. The major problem, is fostering a growth of the economies of the developing nations to levels at which they could meet their payments on the new series of bonded debts.

The principal means, through which we shall build up the per capita output-rates of developing nations, is the export of capital goods from industrialized to developing nations. For that purpose, the exporting countries must extend trade-credit to the importing nations. This credit-mechanism requires the following included measures:

- 1) Values of currencies must be fixed at durable, long-term values with respect to one another. The guaranteeing powers, must aid this system of fixed parities, by establishing afresh a gold-reserve basis for international trade, setting the price of gold at levels consistent with the production of an adequate supply of monetary gold.

- 2) All nations must adopt measures which prevent both economic (cost) and financial inflation of their currencies. This may begin with currency reforms. Anti-inflationary action is sustained over the longer term, by aid of "dirigist" policies of credit-issuance and taxation, to the effect of steering the largest portions of newly created credit and investable savings into technologically progressive forms of investment in production of physical goods and development of basic economic infrastructure. In other words, we must ensure that the values of currencies are based on a hard-commodity value; a currency is valued in terms of the relative value of the amount of physical goods that currency will purchase in the nation which issues that currency.

- 3) The mechanism for generation of new credit, credit in excess of producer's credit to buyers or savings, must be only the lending of currency-notes issued by governments' treasuries through national banking systems. The loan of the newly created credit, in the form of loan of currency-issues, should be restricted to investments in production of physical goods or infrastructure, including credit for export of produced physical goods.

- 4) This must be reinforced by trade-agreements among governments, bilaterally and multilaterally, which have the effect of stimulating international trade. Such agreements should include multilateral agreements of co-sponsorship of major infrastructure projects of those types which are generally beyond the capacity of any one nation.

- 5) Governments must work to establish an international consensus respecting general goals of emphasis in advancement of technology. . . .

'For a True Fourth United Nations Development Decade'

A Schiller Institute Policy Proposal

The proposal excerpted below was prepared under the direction of Lyndon H. LaRouche, Jr. and his wife Helga Zepp-LaRouche. It was submitted under the title "For a True Fourth U.N. Development Decade: A Concrete Solution to the World Economic Breakdown Crisis; A Discussion Paper for the 46th Regular Session of the U.N. General Assembly," by Warren A.J. Hamerman on Sept. 12, 1991. It appeared in EIR on Sept. 27, 1991.

I. Introduction: the current world crisis

The Fourth U.N. Development Decade officially began this year, 1991, at a moment of unparalleled importance in all human history.

The current world economic crisis is unbearable for mankind. . . .

The current situation of world collapse has been caused by the complete breakdown of the international monetary system founded in the Bretton Woods agreements which established the basis for the International Monetary Fund (IMF), World Bank, and related institutions. The ongoing and imminent breakdown of the Anglo-American monetary system broke those Bretton Woods agreements as a functioning world financial system.

This actual breakdown of the functioning Bretton Woods system occurred back in the period 1968-72, and was caused by the collapse of the Anglo-American financial system. The breakdown began with the collapse of the British pound in 1967, the removal of the U.S. dollar from the gold standard in 1971, and the failure of the Azores Conference in 1972. Thus, for a period of over two decades the world has not had a coherent monetary system. Under the influence of policies such as deregulation of banking, pure speculative bubbles of the sort deplored by French Nobel Laureate Maurice Allais have proliferated.

To hold up these gross speculative bubbles, the economies of the world have been sucked dry. The remnants of the Versailles and Bretton Woods financial system are shattered. . . .

The proliferation of pandemics is caused by the fact that the world economic crisis has reached catastrophic proportions. No one can doubt that neither the Marxist economic system nor the liberal Adam Smith free market economics has proven able to deliver food, shelter, education, and medical care for the majority of the people suffering under these collapsing economic systems. For instance, in eastern Euro-

pean experiments, both the Marxist system and radical free market approaches have proven to be equal failures.

The greatest part of mankind today lives in fear of repression without the inalienable rights, dignity, and securities appropriate to the sacred children of God. Many in the Third World who have witnessed the invasion of Panama, the support given the Tiananmen Square massacre in Washington, the unjustified economic sanctions still being imposed against innocent Iraqi children, or the unfolding genocide being encouraged against Croatian freedom fighters, fear that were they to exert their sovereign rights to self-development, they would be risking economic warfare or even military invasions.

II. The alternative: a True Fourth Development Decade

Therefore, the time has come to replace the dictates of a New World Order imposed upon the peoples of the earth by the ruling elites in Washington, London, and a handful of other nations with a *New, Just World Economic Development Order*, by adding "justice" and "economic development" back into the plan for the world community of nations.

The political form of this proposal must take its guidelines from the tendency of our age—as events have been heading in the former Soviet Union—to reject "Empire" and instead promote a "*Community of Principle Among Sovereign Nation States*."

We propose as the principal theme for this community of principle among sovereign nation states the following:

- *A True Fourth Development Decade*

Since the remnants of the Versailles and Bretton Woods system are shattered, it is necessary to start with a new monetary system.

The new monetary system should be based upon a combination of proven methods which the nations of the world can agree to—a combination of the original Bretton Woods gold reserve (*not* gold standard) arrangement with the American System of national banking which the George Washington administration under Alexander Hamilton adopted in the form of the First National Bank of the United States.

In this arrangement, new credit is generated for productive investment in industry, agriculture, and transport when other sources of public credit have broken down. The new credit is prioritized through long-term, low-interest invest-

ments into such productive infrastructure and research and development in order to create ever newer technological improvements. By achieving advances in productivity through technology, the power of man's labor is increased.

So as not to repeat the mistake of the Soviet economic system, by infrastructure we do not only mean large-scale enterprises. Infrastructure associated with small-scale entrepreneurs and family farms plays a vital role in promoting development together with great projects. Among the nation states of the former Soviet Union, means for coordinating economic development are still required. . . .

Credit mechanisms have to be in accord with national sovereignty, since credit is created and regulated at the level of sovereign nations. National credit systems, organized through a national bank along the design of the new American republic during the late 18th and early 19th centuries, not over-reliance on borrowing from abroad, is the foundation of productive economic investment and output.

● *A True Fourth Development Decade* is based upon a desire to end the spread of chaos through the world monetary system by returning to a twofold policy of:

- 1) long-term, low-interest rates for investment in large-scale development projects;
- 2) stable parities among currencies.

These aims can only be achieved through once and for all discarding the International Monetary Fund and related institutions, and replacing them with a new institution based upon the historic ideas of development and economic justice developed by the opponents of radical free market approaches—Leibniz, Colbert, List, Hamilton, Carey, Stolypin, Witte, and Sun Yat Sen—and carried into the modern era by the school of physical economy associated with Lyndon H. LaRouche, Jr.

The coming-into-being of the new institution ought to be the natural outcome of an immediate Preparatory Meeting with the mandate to:

- 1) establish a coordinating committee for large-scale regional development projects throughout the world;
- 2) launch an emergency global effort to halt the spread of deadly pandemics and famine by producing the means to raise the standard of living of all people;
- 3) establish the basis for issuing long-term, low-interest loans for development and currency stability based upon such a new, hard credit system.

The mandate for this Preparatory Meeting shall be strictly controlled by three limiting principles:

- 1) protection of national sovereignty;
- 2) a definitive end to usury and slavery;
- 3) a recognition that health and physical well-being is an inalienable right of man.

IV. What is a True Fourth Development Decade?

The absolute features of a True Fourth Development Decade are fourfold:

1) Absolute respect for the *sovereignty* of nation states, their populations, institutions, and natural resources for their own self-development. Thus, the Fourth Development Decade emphatically rejects the conception of “softer sovereignty” which certain ruling elites in the North would impose upon the nations of the South.

2) Absolute commitment to provide the minimal requirements for life to all mankind through a global commitment to economic development and scientific and technological transfer to all nations so as to modernize agriculture, infrastructure, and industry. Thus the Fourth Development Decade aims, in its first phase, at waging a global war against AIDS, cholera, and other diseases which are afflicting the vast majority of mankind from the desperate populations of Central Africa to the black and Hispanic ghettos of New York City.

3) Absolute commitment to the idea that each and every man, woman, and child on the face of the earth is a sacred individual made in the image of God with the divine right to economic development. Thus, the Fourth Development Decade will resist all direct and indirect forms of “genocide,” or neo-malthusian racial demographic warfare, waged against the non-Anglo-Saxon populations of the world.

4) Absolute commitment to establishing new institutions to finance and invest in the primacy of economic development, productive economic progress, and technological development. Thus, the Fourth Development Decade rejects the arrogance of bankrupt financial institutions to maintain usury, debt service strangulation, and resource looting over the right to life of billions. Already in the August Preparatory Meeting of UNCED for the Brazil '92 Summit in Geneva, voices from the South raised the issue that means for debt relief, technological transfer, and economic development must be established before environmental burdens and “green conditionalities” are imposed on nations already overburdened with oppressive financial “conditionalities” imposed from the outside.

The absurdity of the debt and usury oppression of the world economy is demonstrated by the case of Ibero-America. In 1980, the debt of all Ibero-American nations was \$243 billion. Through the course of the 1980s, these nations paid out \$321 billion in interest payments alone. Yet, at the end of the decade they owed \$429 billion. Furthermore, they lost a minimum of \$158 billion through capital flight which means that their capital exports through the decade was \$479 billion or nearly one-half trillion dollars in payouts, at the end of which they owed nearly double what they did in the beginning.

In terms of the net export of physical capital the picture is even more dramatic. The trade surplus of Ibero-America through the decade of the 1980s was \$218 billion. When the terms of trade (\$180 billion) is added, the total net export of physical capacity becomes \$399 billion. When the net capital flight is added, the figure becomes \$535 billion in physical

loot taken out of Ibero-America during 1980-90, or 13% of the productive GNP of the entire continent.

V. How to initiate the Fourth Development Decade

. . . Therefore we propose to postpone indefinitely the Rio Summit.

In its stead, we propose a Preparatory Meeting for a Fourth Development Decade Conference with the mandate and limiting principles described above. The establishment of a Coordinating Committee for Regional Development Projects is encouraged to begin its deliberations with consideration of the following development proposals which were developed by Lyndon LaRouche and his collaborators over the past two decades:

1) The Productive Triangle Proposal for Western and Eastern Europe: the unleashing of the economic development potential in the "triangle" between Berlin, Vienna, and Paris as a productive "engine" for the world economy. Through the construction of high-speed rail lines, the economic output from this area will be transferred via radiating arms from the triangle into eastern, southern, and northern Europe as well as the Middle East and Maghreb.

2) An Oasis Plan for the Middle East designed to "green the deserts" through large-scale water purification and irrigation projects. The plan includes the creation of artificial rivers and peaceful nuclear energy-driven desalination projects for revitalizing the entire economy of the region.

3) A series of Great Projects for Africa including: the construction of a trans-African East-West Railway from Dakar to Djibouti; transforming the Qattara Depression into a man-made lake; damming the Zaire River to create an inland lake which would provide water to fill Lake Chad for the purpose of greening the Sahara; completion of the Jonglei Canal in Sudan to make it into a breadbasket.

4) The Ibero-American Integration Plan which includes the following projects: a second Panama Canal; a Northern Mexican Water Development Project; the "polygon of Development" to construct a canal system to connect the Amazon Basin with the Rio de la Plata across Brazil, Argentina, Bolivia, and Uruguay; and an East-West railway across the continent through Brazil, Bolivia, and Peru.

5) A series of Great Projects for Asia including: the Pacific and Indian Ocean Basin Project; the Ganges-Brahmaputra development project for water management; the Mekong development project; the construction of the Kra Canal in Thailand.

6) The United States requires a vast program of urban, agricultural, and industrial infrastructure revitalization which has as its aim the realization of Martin Luther King's dream of economic justice for *all* its citizens. Specific programs for the United States would include the North American Water and Power Alliance (Nawapa) plan for water and power increase, building a rapid transport system through maglev [magnetic levitation] and other systems; rebuilding

cities, basic industries, and the capital-goods export capability.

The development project orientation outlined above includes generalized debt moratoria and the construction of new cities founded around a nuclear-powered industrial complex (*nuplex*) in each area, and is vectored toward a commitment to encourage a space program with the aim of colonizing Mars and incorporating the Moon into man's economy in the first third of the 21st century. . . .

The world has long dreamed for a safe, vast, and inexpensive energy supply, and has long looked to the promise of *fusion energy*, the same energy means which powers the sun. In March 1989, scientists first announced breakthroughs in a process known as cold fusion, which added to systematic breakthroughs in hot fusion energy research. . . . Scientists from many nations should be encouraged to embark on this enduring scientific renaissance. . . .

VI. U.N. authority

In contradistinction to the consequences of the New World Order which certain ruling elites would impose, perpetuating genocide, war, famine, disease, and global depression, the proposal for a True Fourth Development Decade described above is consistent with the principles enshrined in the following international instruments:

1) Universal Declaration of Human Rights (adopted and proclaimed by General Assembly resolution 217 A III of 10 December 1948).

2) International Covenant on Economic, Social and Cultural Rights (Adopted and opened for signature, ratification and accession by General Assembly resolution 2200 A XXI of 16 December 1966).

3) International Covenant on Civil and Political Rights adopted and opened for signature, ratification and accession by General Assembly resolution 2200 A XXI of 16 December 1966).

4) General Assembly resolution 1803 XVII of 14 December 1962, "Permanent Sovereignty over Natural Resources."

5) Convention on the Prevention and Punishment of the Crime of Genocide (Approved and proposed for signature and ratification or accession by General Assembly resolution 260 A III of 9 December 1948) and related instruments.

6) Slavery Convention signed at Geneva on 25 September 1926 and related instruments and protocols condemning servitude and forced labor.

7) Universal Declaration on the Eradication of Hunger and Malnutrition (Adopted on 16 November 1974 by the World Food Conference and endorsed by General Assembly Resolution 3348 XXIX of 17 December 1974).

8) Declaration on the Use of Scientific and Technological Progress in the Interests of Peace and for the Benefit of Mankind (proclaimed by General Assembly resolution 3384 XXX of 10 November 1975).

9) Declaration on the Right to Development (Adopted by General Assembly resolution 41/128 of 4 December 1986).

Critique of the Lagos Plan: Stop Club of Rome genocide in Africa

by Lyndon H. LaRouche, Jr.

Editors' note: *On April 28-29, 1980, the Organization of African Unity (OAU), meeting for an economic summit in Lagos Nigeria, issued a document titled "Lagos Plan of Action." It proposed the use of "soft technology" and "alternative energy sources" like biomass, while praising the "positive role" of the International Monetary Fund and World Bank in supposedly encouraging Third World development.*

Lyndon LaRouche and EIR prepared a book-length critical commentary on the Lagos Plan, titled Stop Club of Rome Genocide in Africa! The manuscript was circulated widely, but was never published in English (a Spanish translation did appear). In view of this document's extraordinary relevance to the current crisis in Africa, we publish here an excerpt from the Introduction, and the entirety of Chapters 3 and 4.

Development or neo-malthusian genocide

The rise of the so-called neo-malthusian dogma over the course of the past decade and a half is but the most clearly evil among our four principal varieties of powerful institutional obstacles to the economic development of the continent of Africa. Unless the power of those institutionalized policies is crushed, development is impossible.

Therefore, we propose that no development effort can be called either "realistic" or "practical" unless it includes a resolution for mobilizing forces adequate to eliminate those four institutionalized obstacles.

These four institutionalized obstacles to development are:

- 1) The influence of neo-malthusian doctrines allied to those of the Club of Rome.
- 2) Post-1965-68 policy trends of leading international monetary institutions.
- 3) Institutionalized monetary and trade policies, sometimes denounced as "neocolonialist," antedating 1965-67.
- 4) The hegemony of doctrines of political economy de-

rived from the colonialist doctrines of the eighteenth and nineteenth century officials of the British East India Company (for example, Adam Smith, John Stuart Mill).

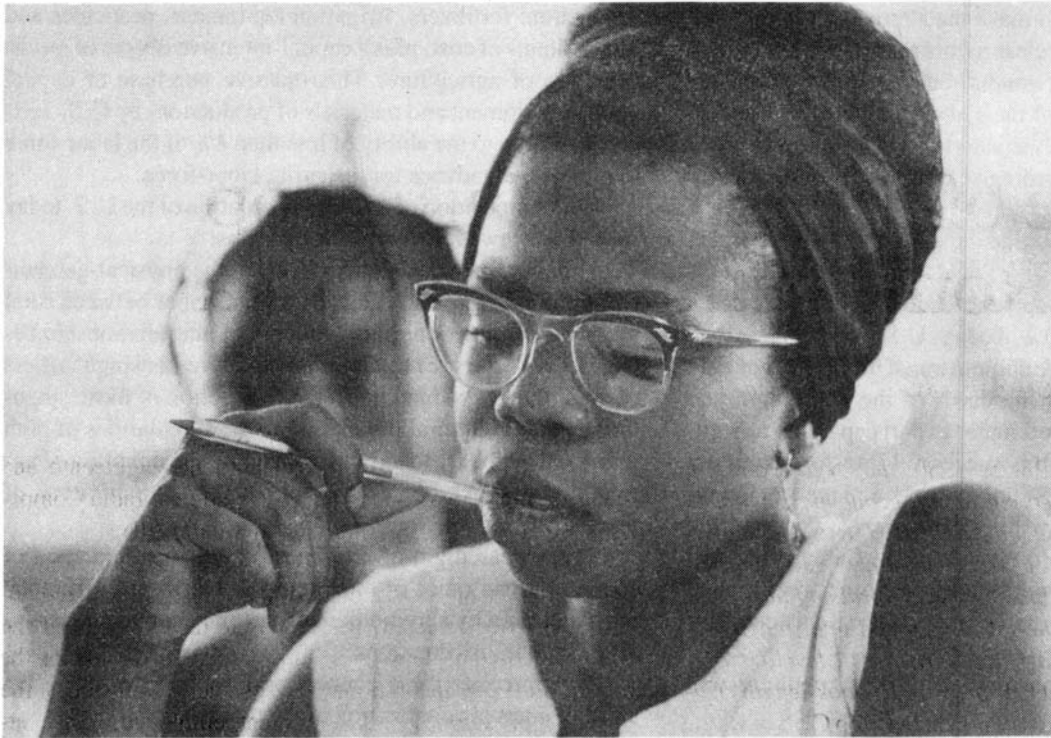
To the extent the first three of these institutionalized obstacles are not defeated, net economic development of the formerly colonial nations is impossible. To the extent the fourth of these institutionalized obstacles influences the methods of attempted development employed, those attempts must fail.

For such reasons, a development resolution becomes practical, realistic, on condition that it begins with a twofold elaboration of policy counter to these four obstacles. First, that policy must treat the body of ideas from which the four cited obstacles are spawned. Second, the policy must define the powerful networks of influence through whose influence such ideas are embodied in institutionalized obstacles of the first three types. This twofold approach must treat the matters not only in opposition to evil conceptions and influences; it must articulate counter-policies and propose counter-forces.

There are two aspects of the most recent centuries of European development which are of special relevance to such a practical and realistic approach. Twice during recent centuries, Europe suffered conditions broadly comparable to those confronting the formerly colonial regions today. In the first instance, we consider the emergence of the Golden Renaissance of the fifteenth century out of the New Dark Age of the fourteenth century. In the second instance, we focus on the central position of Jean-Baptiste Colbert and his famous protégé Gottfried Wilhelm Leibniz in leading the continent of Europe out of the ruinous conditions of the 1618-48 Thirty Years' War.

By focusing attention on those two periods, we define historically the two opposing policies to be contrasted today in the battle for economic development of Africa (in particular).

By adopting such an approach, we accomplish something more than merely defining a realistic and practical approach to institutionalized obstacles. Out of the lessons of the seventeenth and eighteenth centuries' *mercantilist* and *Kameralist*



A student at the Federal Advanced Teachers' College in Lagos, Nigeria. "We view it as indispensable to successful development of Africa to transform a growing population of students into a dedicated elite trained in the principles of development as well as in the professions of scientist, engineer, and technician in such specialties as physics, chemistry, biology, agronomy, medicine, civil engineering, and so forth."

approaches to the successful economic development of Europe we adduce a unified conception of *development*, a conception readily restated in forms immediately appropriate to the case of Africa.

On the positive side of the problem of development, we must move beyond mere lists of particular requirements for development, to a *unified conception of development*.

By examining the "Lagos Plan of Action" from the vantage point of the conception we develop in the following pages, it will be made clear why we see dangers in the method of elaboration of developmental goals employed for the "Lagos Plan of Action."

It should also be clear from the same pages that we view it as indispensable to successful development of Africa to transform a growing population of students into a dedicated elite trained in the principles of development as well as in the professions of scientist, engineer, and technician in such specialties as physics, chemistry, biology, agronomy, medicine, civil engineering, and so forth. . . .

The rural-urban transformation

The leading feature of successful development of the so-called developing regions is the accomplishment of a shift of ratios of households and labor-force from rural to urban occupations and modes of life. This is accomplished chiefly by the deployment of industrial technology (including improvement of transportation) to transform agriculture from

labor-intensive to capital-intensive modes of specialized production of food and fiber. The balanced development of new industrial workplaces, together with appropriate education, to absorb the portions of the population shifting from rural to urban life, is the crucial, included aspect of this process.

The most dangerous among the misguided policies recommended to developing nations include:

1) The "appropriate technologies" doctrine promulgated by the World Bank, and by the World Bank's propagandarm, the Willy Brandt "North-South Commission." The consequence of this proposal must be genocide through means including famine and epidemic, especially among the least developed nations.

2) The proposal developed by the Brookings Institution, and conduited through Henry Kissinger, Unctad, and other channels of subversion, to "solve the problems" of raw materials-exporting nations with cartels modeled on the image of OPEC. This is but the old colonialist policies in a protectionist disguise, leading to the same spread of genocide in developing nations as the "appropriate technologies" evil.

3) Continuations of the "import substitution" policies which the United States and Britain imposed upon Latin America during the postwar period. At best, such ill-advised policies create a better-paid middle-class within developing nations, at the price of increasing the socially dangerous discrepancy between the incomes of a relatively small middle class and the population generally. (Mexico is presently attempting to overcome precisely such disastrous consequences of the imposed "import substitution" policy.)

In due course, we shall make the alternatives to all three such dangerous proposals clear in this report. We begin with elaboration of the leading features of the rural-urban transformation. The significance of the elaboration of *hydrothermodynamics* (thermodynamics situated within the terms of physical geometry) in the preceding section will become clearer as we proceed.

It is most useful to examine the case of the development of the United States.

The first, 1790 Census of the United States indicated a rural population of over 90%. Today, U.S. farmers, less than 4% of the labor-force, have demonstrated the ability not only to produce abundance for the needs of the entire domestic population, but to generate a major export capability as well.

The means by which this successful transformation occurred was outlined as U.S. policy by U.S. Treasury Secretary Alexander Hamilton, in his 1791 *Report to the Congress on the Subject of Manufactures*. Henry C. Carey, President Abraham Lincoln's economic-policy adviser, reexamined the case put by Hamilton a half-century later, richly confirming Hamilton's analysis.

The key to the development of U.S. agriculture was threefold:

1) During the latter part of the 18th century, the literacy rate in the United States was in excess of 90%, more than double the approximately 40% literacy rate then existing in Britain. Contrary to the popularized but false propaganda of Turner and the Anglo-American "revisionist" historians, including Beard, Lippmann, Schlesinger, et al., the American farmer was not a "rough, illiterate frontiersman." He was sometimes called the "Latin farmer" because of the impressive percentage of amateur classical scholars among the farmers as a whole.

2) The development of roads, canals, and later railroads to facilitate marketing of agricultural products, and to promote specialization for market among farmers. This was emphasized to that purpose by Hamilton, and proved a key to the rapid improvement of farm incomes.

3) The development of industry with the understanding that this was uniquely the way in which to increase the productivity and income of agriculture. This was augmented during the 19th century through German influences promoting the use of fertilizers as well as agricultural tools and powered machinery produced by industry.

The typical U.S. farmer or rancher of today operates as an independent farmer on several hundred to several thousand hectares of land. He has a relatively high level of technological competence, relative to technicians employed in industry, and is an independent business executive in the full sense of that term, as well as a self-employed form of productive labor.

This production is not competently interpreted as primarily a connection between the farmer and land. U.S. agriculture is a massive consumer of industrial output for agricultural

production: fertilizers, irrigation equipment, pesticides and related items of cost, plus a capital-intensive degree of mechanization of agriculture. This massive purchase of capital goods (equipment and materials of production) by U.S. agriculture is key to the ability of less than 4% of the labor-force to produce abundance for the entire labor-force.

The composition of the rural population of the U.S. today should be viewed in the following terms:

1) It should be analyzed in terms of the physical-geometric structural features: a) the division of labor between rural and urban production; b) the functional interrelationship between the sectors; c) the internal structure (as singularities) of agricultural production; d) the connection of those singularities of agricultural production to the singularities of both industrial suppliers to agriculture and of consumption of agricultural product; and e) the thermodynamic parameters of these structural relationships.

2) As a paradigm-of-reference for the transformation of the rural-urban ratios of other nations, in the terms of reference indicated by a hydrothermodynamic approach to analysis of such transformations.

To appreciate these connections, we must examine the shifting internal composition of the urban labor-force associated with increasing ratios of urban/rural employment.

Development means not only an increase of the ratio of urban to rural labor-forces. This increase correlates necessarily with a tendency for an increase of the ratio of capital-goods to consumer-goods employment within the urban labor-force. In turn, as the ratio of capital-goods to consumer-goods production increases, there is a necessary expansion in the ratio of scientists and technicians. It is the latter who, in respect to goods production as such, generate the advances in technologies feeding capital-goods development.

It is the advances in technology (and productivity) associated with such interlinked shifts in composition of the labor-force which provide the wellsprings of advances in agricultural technology and productivity, and so forth and so on.

These transformations in labor-force composition and productivity are inseparably dependent upon advances in the quality of education and related cultural development of the labor-force.

These structural transformations of the labor-force's composition correlate with the thermodynamic (negentropic) function $F(W_f/W_s, \bar{W}_s)$.

Analysis of the economy

We now outline a schematic device for conceptualizing the hydrothermodynamic transformation of an economy. This provides us with the basis for an urgently needed replacement for the Gross Domestic Product procedures of National-Income Analysis employed by the UNO [United Nations Organization] and by most nations presently.

Since the fundamental issue of economic science is the development of the power of a population to produce the

material alterations of nature associated with a definite potential relative population-density, the term *productive labor* must be limited to that portion of the total activity of society which is directly consumed in effecting such *material* transformations.

Therefore, we restrict the use of the term *productive* to the production of *useful goods*. We include *transportation*, the conveyor-belt of the economy as a whole, within that designation of *productive*.

The term *useful* is applied to *useful goods* from the vantage point of the concept of *net work done*,¹ as we defined that conception in the preceding section of this report.

There must be a positive correlation between changes in man's practice in changing nature and increases in potential relative population-density. This provides analogs for the "increasing reducing power" of the whole economy's production of goods relative to changes in the state of nature.

Therefore, the exemplars of useful goods are the capital goods (materials, machinery, equipment, and so forth) of agricultural or industrial production of *goods*, and the amount of consumption of produced goods by households needed to provide standards of leisure and consumption consistent with the level of technology of present and immediate-future production in the most advanced industries and agriculture.

In addition to *productive* employment, a society requires certain forms of necessary activities which are *useful, but not productive*.

One example of such useful, nonproductive activities is the work of teachers. The education of the population is necessary for the development of the *potential* productive powers of labor. However, a society of teachers would not be productive at all *as teachers*. Furthermore, the essential benefit contributed by teachers is wasted for the economy except as the labor-force taught is productively employed.

Naturally, the activity of teachers is reflected in the productive output of goods. It is reflected in the *increase of productivity* of productive labor. Thus, by measuring the useful-goods output of productive labor, we have fully accounted, inclusively, for the indirect contribution of teachers to *current production*. To attempt to count the labor of teachers (for example, value-added component of teachers' income) as an amount in addition to the value of output of goods production, would be a folly of double-counting.

The same is true for the organizational contribution to production by the administrators of enterprises, for scientists, engineers, technicians, physicians, and so forth.

The subject of economy is the increase of the material basis for increases in potential relative population-density through advances in the technology of production of useful goods. It is productive labor which directly, and comprehensively subsumes all of that productive activity. Other forms of useful activity have the development of technology and of the powers of productive labor as their subject.

To confuse that distinction, as the practices of national-

income accounting do, generally, today, is to make a mess of everything.

Since the smallest unit of reproduction of a population is the household which produces and nurtures children, the starting point for competent national-income accounting is the *total households* of the nation.

We apportion these total households into two principal categories. In one category we include the households whose labor-force members are employed as productive operatives in agriculture or industry. In the second category, we include other households.

The objection might be raised, that one member of a household may be employed in a productive occupation, while another may be employed in a nonproductive occupation. It might be objected, in the same vein, that a person may change employment from a productive to nonproductive occupation, or the reverse.

From the vantage point of static accounting, this objection might appear to involve a significant difficulty. It is necessary to remind ourselves that the conception of *net work* focuses our attention on *changes in structure*, and the relationship of such changes in structure to values of our negentropic function.

It is required that we count the respective categories of households in a consistent manner, selecting the manner which is consistent with the object of analytical work. It is *changes in the structure of the labor-force, relative to households*, which is our primary datum. We must measure the households categorically according to the requirement of measuring changes in the composition of the labor-force.

We outline the methods of national income-accounting to be used, illustrating the points to be made by a schematic representation which displays the problem in the simplest possible form.

See, now, **Figure 1**. We describe this figure, and then present, in summary, the key distinctions between our usage of the symbology employed and the use of a similar symbology by Karl Marx.

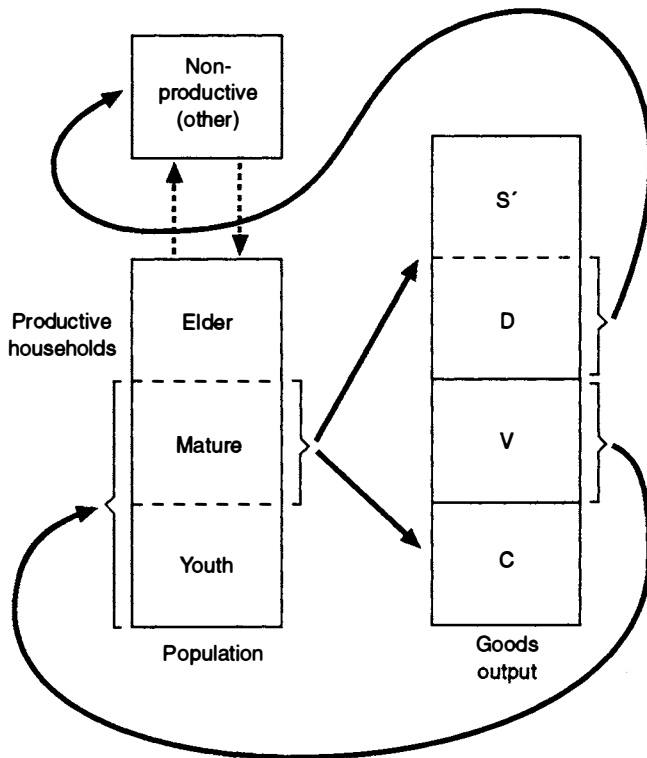
The diagrammatic scheme of Figure 1 depicts the flows of "negentropy," chiefly in the form of useful goods, in the reproductive cycle of a national economy. It represents that dynamic process in terms of imagery appropriate to a static form. We have used this imagery, over a period of a decade and a half of university-level instruction in economic science, and have found such a first-approximation scheme to be most satisfactory pedagogically.

The two left-hand bars apportion the total population of households of a national economy into the two general categories of *productive and nonproductive*. In this case, the upper of the two bars represents the nonproductive, and the lower the productive households.

We have focused, in this diagram, only on the internal features of the productive population of households.

For purposes of simplification at this point, we have di-

FIGURE 1
Total economy



vided the total population of productive households' persons into three age-categories: young, mature persons below the age of retirement from employment as regular productive labor, and persons above that *modal* age of retirement. It is the middle-range which yields productive labor, after deducting for persons engaged in rearing of children and other matters internal to the household itself. This provides a geometric determination of the productive labor-force available.

The bar to the right of the productive households' bar is the production-bar. This bar is analyzed in terms of its goods-output.

The principal categories of goods-output are a) capital goods (materials, equipment, machinery, and so forth) consumed by production itself; b) goods consumed by the households of the productive category; c) a social surplus of goods produced in excess of consumption-requirements for a and b.

The third category, *social surplus*, is subdivided into two subcategories. The first of these subcategories, labeled "d," is the consumer and capital-like goods consumed by the populations and activities of the nonproductive sector of households. The second of these subcategories is *net social surplus*, which we have designated as *S-prime* (S'). This is the margin of total output available for *net work* investments.

The dotted-line connection between the two population-

bars indicates the transmission of services from the nonproductive to productive sector. The heavy arrowed lines show the flow of goods through the system.

We now discuss the symbology used. After that, before turning to the question of methods of analysis, we shall interpolate summary remarks identifying the essential distinctions between our employment of this symbology and that of Karl Marx.

The symbology used for the productive relations depicted is:

- C Capital-goods consumption by production itself.
- V Goods consumed by households of productive labor.
- S Social surplus (total).
- d Nonproductive consumption.
- S' Net social surplus.
- $[S' = (S - d)]$

The key national-income accounting-ratios derived from this symbology are:

- $S/(C+V)$ Productivity.
- $C/(C+V)$ Capital-intensity.
- $S'/(C+V)$ Rate of profit.
- and, for additional reference:
- $d/(C+V)$ Expense-ratio.

It is the changes in these ratios effected over the course of successive epochs of the production-consumption cycle which are the primary objectives of economic analysis.

These ratios are the *social ratios* of the economy, which must be correlated with the negentropic function.

To this purpose, we achieve a useful first approximation of the desired form of analysis by defining "economic" space as follows.

The three independent parameters of this *economic space* of reference are: a) $S'/(C+V)$; b) $C/(C+V)$; and c) \bar{W}_s . This is not a fully adequate definition, for reasons we shall indicate below. However, it provides a method for effecting useful approximations by administrators and economists generally, and has pedagogical importance, as a stepping-stone toward the more adequate notions required.

By defining "economic space" in these terms of reference, the subspace formed by $S'/(C+V)$ and \bar{W}_s approximates the functional term W_f/W_s . The subspace formed by $C/(C+V)$ and \bar{W}_s defines the indicated energy flux density of capital-intensity, approximating the required elaborated (social) form of expression for \bar{W}_s . So, the "economic space" defined by these three approximates the cross-sectional values for a short interval of development of the function $F(W_f/W_s, \bar{W}_s)$.

By means of enriched treatment of the schema, to account for the interactive subcategories of productive employment (agriculture, forestry, fishing, mining, manufacture of capital goods, manufacture of consumer goods, energy production, etc.), and subdividing those subcategories in terms of types of industries, our analysis converges upon the degrees of successive refinement required.

For example, for use of more limited computer facilities, useful approximations for treatment of certain kinds of analytical tasks can be accomplished in treating each category of industry in an economy as contributing its output through a pipeline-like connection to the general common pipeline of total output.

That approximation breaks down if we explore the analytical problems more deeply. In practice, we must allocate among all the industries according to the indicated resulting improvement for the performance of the economy as a whole in terms of the function we have described.

The case of Karl Marx

Marx is situated between the British East India Company propagandists and the continental mercantilists-Kameralists in chiefly a twofold way.²

Marx is essentially what he defines himself to be in political economy. He is a continuation of the "rationalist" phase of the British East India Company propagandists, most emphatically Adam Smith and David Ricardo.

Without otherwise changing any of the axiomatic assumptions of the British school to which he adhered, Marx effected several relatively important improvements of British political economy within that limiting set of conditions. Central, of course, is Marx's application of the notion of *labor-power*.

Contrary to the lying Friedrich Engels, Marx was by no means the discoverer of "labor-power." The discovery was made, and in a richer and more rigorous form than Marx's writings ever suggest, by Leibniz during no later than the 1670s. Moreover, Leibniz's conception of the "productive powers of labor" was incorporated as the national policy of the United States during the first administration of President George Washington, as the central feature of Hamilton's *Report on the Subject of Manufactures*. This same conception was central to the work of economists associated with the Ecole Polytechnique, including Chaptal and Dupin. It was popularized throughout leading German circles before Marx's youth by the Leibnizian Kameralists and by leading figures such as Friedrich List.

On this point, Marx's libelous mistreatment of List and Carey (both at the prompting of Engels) is the most naked instance of willful intellectual dishonesty by Marx. Not only did he exhibit acquaintance with the writings of both List and Carey, but did so by publishing fraudulent attacks upon them while otherwise borrowing from the work of both.

Although Marx employed the conception of labor-power in a delphic, borrowed form, he was a dedicated anglophile in philosophy, science, and political economy; at least, anglophile relative to the principal differences between British and continental scientific thinkers. Correspondingly, he situated his limited use of the borrowed notion of "labor-power" within the axiomatic setting defined by the works of Smith and Ricardo.

Marx succeeded in his four-volume *Capital* in proving conclusively that the British model of political economy is inherently subject to malthusian, anti-technological-progress tendencies, and to periodic monetary-crisis breakdowns. Insofar as he correctly insisted upon technological progress as a matter of fundamental human-species interest, he relegated that hope to an anti-capitalist society in the well-known fashion.

This inner contradiction within Marx the political economist extends into matters outside political economy as Marx defined it. Correspondingly, today, as the Socialist International leads in promoting neo-malthusianism, members and co-thinkers of that Socialist International deplore what some of them describe as the "Platonic impulse" in Marx's work. They propose a "Marxism" stripped of all taint of such "Platonism."

The accusation of a "taint of Platonism" in Marx is valid. This shows in one of the earliest of the surviving literary works of Marx, an 1835 school essay written as an examination exercise under the direction of Johann Hugo Wyttenbach at Trier. It shows prominently in several locations, including Marx's contribution to the 1846 manuscript *The German Ideology*, and in the treatment of the subject of the interrelationship between "freedom" and "necessity" in Section VII of *Capital*, Vol. III.

Those qualifications noted, in all other respects, Marx's political economy is thoroughly and predominantly a variation within the bounds of the British East India Company school.

This observation applies to Marx's usage of the symbolologies for *C*, *V*, *S*, and "*d*" (which he defines differently than we do, and terms "capitalists' consumption"). Although the British political economists of the "rationalist" phase pretend to be the originators of political economy, they came into this field relatively later, long after Plethon had introduced formal political economy into western Europe during the early 15th century, and after the seminal work of the mercantilists and Kameralists, including Jean Bodin, Serra, Becher, Leibniz, and Alexander Hamilton had been well established and widely circulated. Hence, the origin of the categories for *C*, *V*, *S*, and *d* in British "rationalist" political economists is British delphic plagiarism.

The British borrowed extensively from such sources. After borrowing, the British not only pretended to have invented such conceptions themselves. The British used the adopted authority of having made such discoveries, to attribute to those conceptions a meaning entirely different than those from which they borrowed.

This is the classical *delphic* method. That is the term used to describe this method of fraud in memory of the Cult of Apollo at Delphi. Sometimes professed as a method by Jesuit spokesmen, the "delphic method" was otherwise known in ancient Greece as the method of sophistry. Through the activities of the school of rhetoric of Isocrates at Athens, the terms



A science laboratory in Kenya. "Our included concern for the development of Africa must be to shift rapidly the average composition of skill levels in the labor-force as a whole. This is best accomplished by development over two successive generations of proportionately large infusions of young, relatively well-educated Africans into the labor-force."

sophist and rhetorician came to have the same connotations.

The opening of the chest of private working-papers of Isaac Newton, by John M. Keynes and others after him, contributed powerful circumstantial corroboration of the otherwise well-documented evidence that Isaac Newton, like his accomplice [Robert] Boyle, was a swindling plagiarist of this delphic variety. Newton and Boyle plagiarized liberally from Hooke, as well as from [Christian] Huyghens and Leibniz. In Hooke's case, Newton and Boyle took over whole chunks of Hooke's written work with scarcely any philosophical alteration. In the case of philosophical opponents, such as Huyghens and Leibniz, the delphic method was used. The bare form of a conception was plagiarized, and then the discovery of the conception so plagiarized was attributed to a philosophical method directly opposite to that through which the plagiarized discovery had actually been effected. The chest of Newton's papers indicated that Newton had been fully occupied in the attempt to practice primitive black magic all during the period he pretended to be occupied with scientific investigations.

The economic categories which Marx adopted from the hands of his British political-economist predecessors were original neither to Marx nor those British predecessors. They were transmitted to Marx as delphic distortions of the scientific conceptions earlier developed by the mercantilists and Kameralists of the 16th through 18th centuries.

Although there are points of agreement in definition of empirical data between our own and Marx's description of some parts of these categories, that is the only point of agreement. The attempt to interpret these terms from a Marxist vantage point must inherently lead to disaster. As for the argument that the case of Soviet development seems to indicate otherwise, the fact of the matter is that Soviet development is chiefly V.I. Lenin's effort to adopt American methods and German technology for ordering of the nationalist (non-capitalist) economic development of that nation.

Illustration: population policy

We shall now develop a series of examples, to illustrate the kinds of conceptual approaches to developmental policies this method implies. These examples will include, but not be limited to, refutations of the three dangerous policy-proposals cited at the outset of this section of our report: "appropriate technologies," "raw materials cartelization," and "import substitution."

We begin now with a treatment of exemplary features of population policy.

The advancement of technology in the OECD nations has raised the modal school-leaving age of employable labor to between 17 and 25 years—with only a small ratio of exceptions for this (such as physicians). We would argue, and strenuously, that the quality of education provided is poor, and has become increasingly worse over the course of the past two decades of "educational reforms." We ourselves would insist that in most instances students fail to learn adequately in universities what they should have mastered in properly reformed secondary schools. Nonetheless, once such criticisms have been duly noted, the fact remains: advances in technology do raise the school-leaving age for new members of a qualified labor-force.

In the case of the United States, it is useful to compare the educational requirements of the industrial labor-force at the beginning of the century with requirements of the immediate postwar period. At the beginning of the century, basic pre-skills requirements for members of the main body of the industrial labor-force were satisfied by approximately a grammar-school level of education. By the postwar period, for aerospace and related levels of industrial technology, the functional equivalent (in combined education and experience) of one or two years of technical education above the secondary-school level was required.

The portion of the population of households represented by persons at a pre-labor-force age-level is a definable percentage of the entire population of those households. The

increase of this percentage increases the social cost to adult labor-force members of households, in providing the maintenance and education of the young over an extended period.

In addition, the advances in technology which correlate with increases of the school-leaving age are associated with actual or imputed increases in \bar{W}_s . This increase is expressed as an increased cost per individual member of society.

These considerations make it increasingly intolerable to tolerate high death rates. It becomes necessary to increase the average span of the productive lifetimes of adult members of the labor force. Life-expectancies typical for poorer sections of the populations of developing nations, and for most of Africa, are intolerably low.

Part of the increase in value of \bar{W}_s is a reflection of the increased nutritional quality, hygiene, and health-care requirements associated with increases in mean longevity. The largest increments of cost associated with such improvements are for improved nutrition and sanitation.

Health care is a high-technology, predominantly labor-intensive service. The average age of specialist physicians completing residencies defines the limited number of years of practice of the trained specialist. For delivery of health care, there must be an increasing ratio of total physicians per specialist physician, and increasing ratios of biological scientists, technicians per active physician, as well as required ratios of nurses, paramedical employees, and non-medical logistical support for hospitals, clinics, and other institutions of medical practice. The costs of maintaining adequate training facilities and programs for producing such physicians and other specialists of health-care work is a very considerable part of the total cost of health-care services.

In general, the principal frontier of medicine is conquest of illnesses which are, directly or otherwise, characteristically diseases of aging.

For example, if rates for cancer are properly constructed, the rate of incidence of cancer in the United States has been declining. Cancer is predominantly a disease of aging. Therefore, as longevity increases in a population, as it has in the United States, more persons live to the age at which contraction of cancer is probable. So, the incidence of cancer in populations must be measured not per member of the population, but for the population of each age-interval. By such standards, the incidence of cancer has declined, and the death rate from cancer has declined more significantly.

From the standpoint of economics, the physician treating one patient is implicitly treating the entire population. By combatting disease or injury in the person to which this occurs, the medical profession is mastering the disease or injury, by fighting it from case to case. The knowledge gained by fighting a disease such as cancer, often at a high cost per individual treated, leads toward development of methods and procedures by which the disease is ultimately mastered, and at a relatively low cost per member of the total population threatened by such disease.

From a broader view of this same aspect of medical practice, the combat against diseases associated with aging is, taken in totality, an integral part of the process of comprehending and treating those processes of aging of tissues which are direct or implicit causes for the termination of life or impairment of capabilities at age levels of, for purposes of reference, 85 to 90 years.

If we could master the problems of aging more adequately, this would raise the age level for full physical productive competence. The power to accomplish this would be of no

The fact remains, the development of the economy of Africa demands a substantial increase in the mean longevity of the African population. Without increased longevity, we cannot support the levels of education and leisure required by modern technology. Directly contrary to the Club of Rome and its accomplices, a relatively high birth rate is a precondition for rapid rates of economic development.

trivial economic importance for nations such as the United States today. It would also be of great moral importance in several ways. No moral person can accept as tolerable reduced quality or capacity in the aging, or condemnation of a retired person to contemplation either of an early death or a decade or so of an imposed sense of social uselessness, under the kinds of social policies presently prevailing in a number of nations including the United States.

Some of those cited considerations may appear to be luxuries beyond realistic concerns for the present state of most of the African continent. The fact remains, the development of the economy of Africa demands a substantial increase in the mean longevity of the African population. Without increased longevity, we cannot support the levels of education and leisure required by modern technology.

Directly contrary to the Club of Rome and its accomplices, a relatively high birth rate is a precondition for rapid rates of economic development.

Our included concern for the development of Africa must be to shift rapidly the average composition of skill levels in the labor-force as a whole. This is best accomplished by development over two successive generations of proportionately large infusions of young, relatively well-educated Afri-



A geometry class in Mozambique. "Not only is the infusion of educated youth the key to increasing in a major way the mean productivity of the labor-force of African nations. It has been demonstrated repeatedly that advancement of the cultural levels of matured generations is best accomplished through the effects on those generations of education of the children and youth."

cans into the labor-force.

This assumes that we provide the nutrition, sanitation, and educational programs needed to accomplish that, and that we provide the productive workplaces needed to absorb such increments to the labor-force according to those acquired skill levels.

Not only is such an infusion of educated youth the key to increasing in a major way the mean productivity of the labor-forces of African nations. It has been demonstrated repeatedly that advancement of the cultural levels of matured generations is best accomplished through the effects on those generations of education of the children and youth.

This point implies, and properly so, that the development of Africa must be directed to what the nations of Africa are to become in such target-years as 2000 and 2020. Everything should be focused on attempting to achieve an approximation of economic break-even of income and costs of development now, with development directed to preparing for the infusion of young, educated members of the labor-force added during and between the signal years of A.D. 2000 and 2020. The conception needed is one of *development of the productive powers of an entire population over a development-period spanning two generations*. "Forty Years of the Child" would be one useful thematic name for what must be accomplished.

Longevity and *education* should be prominent themes of key improvements in social policy over the span of this indicated period.

This, it should be obvious enough, is implicit in the appli-

cation of the notion of increasing the potential relative population-density to the structural features of the social process before us.

Illustration: 'appropriate technologies'

The doctrine of "appropriate technologies" associated with proposals of the World Bank and Brandt "North-South Commission" are clearly proposals for genocide.

In the case of numerous backers of that policy, as of the Carter administration's "Global 2000" dogma, the intent to cause genocide is fully conscious, and a more fully conscious commitment to genocide than was proven at Nuremberg respecting Nazi wartime policies in occupied zones of Europe. The deaths which those strata intend to effect by such methods of famine, epidemic, and homicidal social chaos (regional wars, etc.) range in projections from hundreds of millions to literal billions—over the course of the coming two decades.

There should be no pretending that the ultimate authors of the Club of Rome and allied population-policies are not among the most evil creatures ever to attain positions of great influence in the policies of nations. By the standards of Nuremberg, many of those should be tried and hanged now—before the mass murder is actually accomplished.

There are others who support such wicked policies of genocide out of what might be described as "moral indifference." They are aware that *the accelerated deaths* of billions is the willful intent of "appropriate technologies" and related policies. Yet, the best estimate we can offer from the extensive interviews with such persons over a period of about eight years to date, is that they reconcile themselves to supporting such genocidal policies, by refusing to face the reality that those to be murdered are not population-statistics, but actually individual human beings. This sort of person says of the genocidal implications: "Unpleasant, but perhaps unavoidable."

There are others who hysterically refuse to face the genocidal implications of these policies. They refuse to make conscious, or to permit others to cause them to become conscious, that reducing the caloric daily intake to less than 1,200 or even less than 1,000 calories per person creates the circumstances under which the slightest trauma triggers famine, epidemic, and homicidal forms of social chaos.

Most of black Africa heads the list of populations to be wiped out by genocidal means over the coming two decades.

In the effort to be clever, in a manner typical of the British leading strata, the forces behind this genocide prefer to dupe peoples of former colonial regions to adopt the policies which create the preconditions for famine and epidemic. The adoption of a "soft" approach by the Brandt "North-South Commission" is typical of, and leading among such British-style tricks. The function of the trick is obvious enough: to avoid the political reactions, within the metropolitan populations themselves, which would be triggered by stalwart African

denunciation of such tricks as outright genocide. In fact, the policymakers supporting genocide within governmental agencies of the United States and other nations, have been privately explicit on this point. They fear, most of all, the eruption of revulsion against such evil policies from among the still-moral, but poorly informed majority of the electorates of the metropolitan nations.

The intensification of labor-intensive agriculture, the principal feature (in fact) of the “appropriate technologies” proposal, means the rapid devolution of the fertility of the land more intensively exploited by these means. This is coupled with the fact that present average levels of productivity in the least-developed nations are already at the verge of conditions for spreading famine and epidemic.

If British varieties of political-economic superstitions had not corrupted the world’s economists so widely, the genocidal implications of the Brandt Commission’s proposals would have been recognized immediately by all statesmen—and the ropes of Nuremberg would have been hung out in anticipation of the results of proceedings against the wicked perpetrators of such monstrous proposals. The type of analytical problem posed by this issue of policy is among the most basic topics of a properly conceived introductory course in economic science.

That analytical problem ought to be regarded as a classical illustration of the interconnection between the thermodynamic and hydrodynamic facets of economic processes. We focus attention on the hydrodynamic facet first.

The first rule-of-thumb measure of the degree of economic development of a state is the ratio of urban to rural productive occupations. This is conditional, of course, on the assumption that a high proportion of the potential labor-force is employed, and on the further assumption that nonproductive forces of employment are predominantly of a necessary and useful form. (Worse than an excess of such parasites as pimps, prostitutes, and croupiers, is the sufferance of such evil professions as sociology or the Tavistock variety of brainwashing behavioral psychologist. Such latter, together with kindred species of anthropologists, have proven to be among the most poisonous influences developing nations have imported from metropolitan countries.)

This rule of thumb is properly refined by considering the correlation of the urban-rural ratio with the ratios for capital-goods to consumer-goods employment within the urban sector. This is refined further by shifting from a static to dynamic view of those same and related social ratios. It is the rate of increase of urban relative to rural productive employment, combined with the rate of increase of productive employment of capital-goods over consumer-goods sub-sectors, on which attention must be focused.

It is not only a historical fact, but a necessary condition of economic development, that as any sector becomes relatively small, significant progressive shifts in employment emphasize the relatively more populous sub-sectors of the

division of labor.

In respect to agriculture itself, the validity of the ratios depends upon the production of an adequate and improving nutrition for the population as a whole.

(For the moment, we leave out of consideration the special case of an industrialized nation which purchases its food chiefly as imports through export of corresponding values of industrial goods.)

By these indicated standards, the conspicuous nation with the worst policies today is the People’s Republic of China. In terms of rough measures of social ratios, China is one-twentieth as developed as the United States. Worse, the persistence of high ratios of marginal grades of rural employment has been aggravated by policies such as the “Great Leap Forward” and “Cultural Revolution.” The consequence of such efforts to maintain the social basis for continuation of the ancient mandarin order of rule by secret societies, is the adoption of policies of genocide as operational policy of the government of that wretched nation.

It is documented, for example, that the genocide perpetrated in Kampuchea by the regime of Pol Pot was conducted under direction of Peking advisers, according to policies for genocidal depopulation of Southeast Asia elaborated by the Peking regime. According to U.S. diplomatic-intelligence and corroborating sources, systematic mass murder on a massive scale is currently an operational internal policy of the Peking regime. This policy is corroborated inclusively by official Peking channels.

The People’s Republic of China is economically backward not only in social ratios of development. The degree of this backwardness is a consequence of an intent to keep that nation in such rural backwardness, on behalf of maintaining the characteristic social base for mandarin ideology in that nation. The irrationalism and effective de-urbanization conducted as policy-intent, under such rubrics as the “Cultural Revolution,” are exemplary of this connection, as is the reflection of bloody intramural fights within the ranks of secret societies (in existence since the Han dynasty) in the so-called Gang of Four trial recently.

The promotion of infanticide as official policy of the Peking regime today is viewed, and properly so, as variously a resurrection and perpetuation of the recurring infanticide endemic to mandarin society over preceding centuries. On the one side, the Peking regime’s ideologically motivated determination to keep the labor-intensive rural population overwhelmingly predominant, presumably to curb the rationalist, “New China” influences of urban culture, produces conditions under which the nation is unable to sustain its population—because of its low potential relative population-density. This defines the economic preconditions for the current practice of systematic mass-scale murder in China. The mass murder so conducted coincides with recurring episodes of depopulation endemic to the mandarin order—the same mandarin order whose continued influence, through peasant-

oriented secret-society agent Mao Zedong et al., created the recurrence of these conditions.

These past China conditions did not have to come into being again. If the urban-industrial development had been encouraged, this would not have occurred. However, the mandarin ("Old China") factions rightly view industrial-urban development as strengthening the social basis for "New China" philosophical world-outlooks. So, Peking has vacillated between its perceived as unavoidable needs to have modern technology at its disposal, and its concern to limit and contain the development of a social base expressing the characteristic anti-mandarin rationality of urban-industrial development. The outcome of the successful containment of the "New China" forces by the "Old China" forces has been the overtaking of China's potential relative population-density by the requirements of its predominantly labor-intensive rural population.

If we compare the limited, and relatively backward industrial base of China with its labor-intensive rural base, we find illustrated more or less exactly the logic of the Brandt Commission's proposals.

Although the industrial base of China is numerically large in terms of labor-force, by modern standards it is a relatively small percentage of the total population. The imposition of appropriate-technologies dogmas upon the developing nations generally, under conditions of metropolitan nations' becoming "formerly industrialized" powers such as Great Britain today, creates a situation between North and South analogous to the situation between the urban and the labor-intensive-rural sectors of China.

The bare hydrodynamics of the developmental process emphasizes the shifting of the social composition of the labor-force to higher states of organization: shifts from rural to urban productive occupations; shifts within urban productive employment from consumer-goods to capital-goods production; and emergence of increasing ratios of scientists, engineers, etc., in correlation with an increase of the proportional capital-goods component of urban production.

It is in the process of transformation from relatively lower to relatively higher states of organization of the social division of labor, that thermodynamics manifests itself. In social terms, the increase of capital-intensity associated with negentropic shifts in structure is represented by $C/(C+V)$, and the work-correlative of this increase in \bar{W}_x . The flow of produced goods to effect the increase in capital-intensity of production is reflected in the social ratio $S'/(C+V)$, which correlates with W_p/W_x .

Reduced to barest terms, the possibility of shifting the ratios depends upon the average productivity of the economy (labor-force) as a whole. The possibility of a shift from rural to urban occupations depends upon increasing agricultural productivity per hectare and per capita, to the effect that the total production of nutrition and fiber increases, while the percentage of the labor-force required to produce this increas-

ing amount and quality shrinks.

This latter means irrigation, soil treatment, fertilization, disease control, and mechanization.

It is a dangerous illusion to imagine that any increase in agricultural output could be *sustained* by labor-intensive modes.

The case of Brazil is paradigmatic.

To contain the economic development of Brazil, Brazil's international bankers imposed upon that nation the burning of forests (as a substitute for import and development of fossil and nuclear fuels), and the added program of labor-intensive forms of Amazon agricultural development. Tens of thousands of square miles of Amazon rain forest were stripped annually under these programs.

The attempt to produce repeated crops in deforested rain-forest soil means the transformation of the soil into untillable laterite or similar effects. The lessons of slash-and-burn methods in African rain-forest regions reflect the fact that no sustained tilling of such soil over successive years can be accomplished by labor-intensive methods. The destruction of ancient civilizations in Kampuchea, through transformation of rain-forest areas into laterite by such practices, ought to be classical.

This is an illustration of the notion of the relative population-density associated with a level of development of practice of technology. The existing limitations of land cultivation in Africa by what some wish to term "traditional" methods are expressed by the limits of population implicit in the potentially sustainable exploitation of available areas by such methods. To attempt to force an increase in production without advanced technologies of production, means to produce effects like those in the cited Brazil or ancient Kampuchea case.

The effects of an "appropriate technologies" policy can be catastrophic in other kinds of side effects.

Stable weather systems are positioned through interaction of global atmospheric systems with columns of moisture from vapor emission of plants. The stripping of vast areas of rain forest in Brazil reduced significantly the rate of vapor emission, from the high rates of forest trees, to the lower rates of crops, brush, and grasses. In a similar fashion, the deforestation of large regions of India raised the mean temperature. The result of "appropriate technologies" practices in the Brazil rain forest region, was to cause the shift of the Amazon High into the Atlantic, with catastrophic, chain-reaction consequences for the global weather system.

In Africa, a relatively short period of intensified overgrazing and related practices in the Sahel region, produced a shift in weather and rainfall patterns, causing the desertification of a region which, if developed with aid of modern technology, could be the cereal-producing region for hungry Africa.

The development of the biosphere reflects the same laws of the universe we encounter in different form in the develop-

ment of society. The positive evolutionary development of the biosphere has a long-term functional characteristic of the form $F(W_f/W_s, \bar{W}_s)$. If we degrade the biosphere, the net work which can be extracted from it for human use is reduced. To extract more useful work from the biosphere, we must raise its negentropic level.

To raise the level of the biosphere means two things. It means a more efficient consumption of sunlight, by increasing the conversion of sunlight into biomass. We accomplish this with aid of "artificial energy" added to the production of biomass. This takes the form of irrigation, of replenishment of trace-elements in soil, by other measures of soil treatment, by addition of "energy" in the form of fertilizers, and also by use of "energy" in the form of mechanization to reduce the social cost of measures needed to care for the flourishing of biomass.

In biomass evolution, as in social development, the notion of net work done is inseparable from the notion of transformations of the physical geometry of biological processes. For example, in the animal cell, it is well-known that the ratio of potassium to sodium ions is crucial for determining "energy functions" of the cell, and for resisting aging of tissues. An excessive consumption of sodium salts is a killer, and a deficiency of potassium is also a killer. The biochemical processes are a structuring of "energy-flows." More accurately, what we interpret as energy-flows are in reality matters of *virtual work* and *net work done* in terms of the progression from relatively lower to relatively higher qualities of physical-geometric organization. It is by adding the proper *singularities* (degrees of freedom) to the biological processes of agriculture, that we increase the potential relative population-density of an average square mile of land in terms of nutritional potentials.

The labor-intensive cultivation of land on extended scales, among the proposals included in the "appropriate technologies" dogma of the Brandt Commission, means a stripping of the soil of mineral and other essential qualities, together with a lowering of the levels of biomass in newly cultivated areas. The best estimate of the results, based on studies of various large-scale areas for which such extension of labor-intensive agriculture has been proposed, is that an ecological collapse of such projects must occur in a relatively short time—a few seasons. This knowledge is widespread among agronomists and related categories of biological-science specialists—so that we are obliged to report that any Brandt Commission defender who denies such facts is either an incompetent or a liar.

Illustration: raw materials cartels

It was argued by the Club of Rome, with aid of a willfully fraudulent *Limits to Growth* report, that the world's "finite essential raw materials" were soon to be exhausted. Refutation of the fraud perpetrated by two neo-malthusian hoaxsters from the Massachusetts Institute of Technology, Meadows

and Forrester, leads one to a correct understanding of the genocidal implications for developing nations of the proposal to create raw materials cartels modeled upon OPEC.

There is no *absolute* shortage of raw materials. A cubic mile of the average crust of the earth's surface contains a major portion of all of the raw materials required by mankind as a whole for one year. Each year, through using up of produced things, we turn back a mass of raw materials to earth in the form of waste.

In principle, the human species is presently at the level of new technologies through which we are capable of efficiently extracting the scarcest varieties of raw materials. Such a method is named *isotope separation*. In principle, by merely fostering the continued development of the full range of nuclear technologies and related matters of plasma physics, during the course of the next century, mankind will be enabled to actually process a "cubic mile of earth" *economically*.

The apparent shortages of raw materials, apparently existent or apparently threatened over the decades ahead, are simply matters of *cost*.

The limitations on exploiting raw materials defined by cost are made efficient for society in the following general manner.

If we increase the cost of exploiting raw materials, this increases costs associated with C , thus reducing S' . At a certain point, such increases in C cause S' to become negative in value. Thus, we then have $-[S'/(C+V)]$, and negative values for the characteristic function $F(W_f/W_s, \bar{W}_s)$.

This means a devolution of society (entropy), and a lowering of the potential relative population-density. As this potential falls below the level of existing relative population-density, degenerative processes not only reduce the population (famine, epidemic, and so forth), but impel the population toward some parody of primitive savagery.

This has occurred, in fact, numerous times in the existence of mankind.

During the reign of Charlemagne's contemporary, Caliph Harun al-Rashid, the region known today as Iraq sustained a population in excess of 30 million, compared with approximately 10 million today. This collapse of population levels was caused chiefly by a process of devolution set into motion with the rise of Asharism over the course of the 10th and 11th centuries A.D. This was a phenomenon of book burning and general reversal of technological progress, analogous to what has occurred under Khomeini in Iran, under Pol Pot in Kampuchea, and is emerging as a trend in Nicaragua under Tomás Borge at this time. The Mongols, steered in the Middle East by the Venetian oligarchy's intelligence service, merely completed the destruction of a culture already plunged deeply into self-imposed technological and moral decay.

This is comparable to the combined effects of Genoese usury and the Khomeini-like cultisms which plunged 14th-century Europe into a New Dark Age. Although the Black

Death reduced by one-third the population existing at the beginning of its onslaught during that century, this was merely the concluding phase of epidemic of a century-long process of halving the size of the population which began with the defeat of the Hohenstaufen in A.D. 1268. France, for example, did not reach early 13th-century levels of population again until the 18th century.

This example should be stressed, since the political conditions of Europe during the 14th-century New Dark Age were adopted as a model by John Ruskin's Pre-Raphaelite Brotherhood during the 19th century. The systematic depopulation of black Africa was first proposed by Ruskin's famous Cecil Rhodes, and has been the continuous policy-perspective of that faction of the British oligarchy, including H.G. Wells, Bertrand Russell, the London Tavistock Institute, and the world federalists, down to the present date. The neo-malthusian world-federalist faction behind such associations as the Club of Rome, World Wildlife Fund, Aspen Institute, and the international "environmentalist" movement generally, includes that British faction of Ruskin's political heirs as a leading component. The Brandt Commission is essentially a mere propaganda-arm of those forces.

The Western Hemisphere's so-called pre-Columbian period is one of the clearest demonstrations of such catastrophes.

It is clear from economic analysis of the ruins of ancient Mayan cities and related evidence, that a profound catastrophe collapsed the level of civilization in key parts of the Western Hemisphere during the course of the first millennium B.C. Although there were periods of reconsolidation of society subsequent to the first-millennium B.C. collapse, the general trend of culture in the Western Hemisphere was downward over the two millennia between the onset of the collapse and Columbus's arrival.

Among the indigenous populations of North America, there was a higher level of culture (and population) some centuries prior to the 16th century, than was encountered in America by Europeans of the 16th, 17th, and 18th centuries. The cultures encountered were in no sense *primitive* cultures, but were rather the results of a degeneration of peoples into savagery, from a preceding, higher level of culture.

Africa is a largely unwritten archaeological and philological record of such traumatic devolutions. There are probably few, if any, cultures classed as *primitive* by Europeans during the period from the 15th century onward which were in fact *primitive* in the strict sense of that term.

In the lesser aspect of such factual evidence, this shows that most efforts at civilization have collapsed, and with those collapses has come a spiral of depopulation and descent toward savagery. That fact is a subject for extended scientific inquiry in its own right. The point to be stressed here in that connection is the lesson that such collapses of entire civilizations, including the present global civilization, are entirely within the reach of possibility.

The reasons for such collapses in known cases are consistently of two principal kinds.

In cases such as the cited example of the ancient Kampuchean culture, the looting of the rain-forest area by labor-intensive methods turned the soil into laterite, and the civilization collapsed accordingly. The fixing of the level of technology, as typified in an evil form of such policies by the Brandt Commission's "appropriate technologies" policy, must always lead toward a genocidal collapse of the economy.

The other cause for known cases of such collapse is typified by the ruinous effects of Asharism upon the civilization of the Arab Renaissance, and by analogous cases such as Khomeinism in Iran, Pol Pot in Kampuchea, and the role of cultism in destroying Europe during the latter 13th and 14th centuries. Today, the "flagellants" destroying European culture from within are the "environmentalists" and the associated spread of the irrationalist rock-drug counterculture, the so-called alternative culture.

Contrary to those who wishfully avow thermonuclear war or an induced global biological catastrophe to be "unthinkable," and therefore improbable to a point of virtual certainty, mankind has repeatedly demonstrated his capacity to destroy himself, to effect the self-destruction of entire civilizations. The fact that society today tolerates the Club of Rome and allied forces, and that leading nations consent to policies—such as "International Monetary Fund conditionalities"—which accomplish the Club of Rome's genocidal purposes, is adequate evidence that only a major effort *directed against these forces* will prevent civilization—and perhaps even the possibility of future human existence on earth—from destroying itself during the immediate period ahead of us.

As early as the late 1960s, leading policymaking influences behind the neo-malthusian effort of that period defined the curtailing of freshwater development and of energy supplies as the most efficient preconditions for effecting genocide on a global scale. For that reason, President Carter curtailed water projects inside the United States. For that reason, the development of nuclear energy was sabotaged, to ensure global dependency on fossil-fuel supplies, whose production and/or distribution was under the marketing control of the same complex of London-centered financial forces controlling the London-based "Seven Sisters" of world petroleum marketing.

These forces rigged the 1973-74 petroleum crisis, and were directing hands behind the 1979 increase in OPEC and other petroleum prices. These price increases, combined with London and Bank for International Settlements-coordinated monetary policies, effected a collapse of world trade and production levels of both industry and agriculture. In consequence of these devolutionary effects, there is a growing glut in world petroleum supplies, even at sharply reduced levels of OPEC production.

The most savage effects of the rise in OPEC prices were

suffered by developing nations. Those developing nations specializing in non-petroleum raw-materials exports suffered lawful declines in their earnings. The consumption of energy is chiefly determined by the use of energy by industry and high-technology agriculture, plus household and commercial consumption, which is itself greatly affected by declines in general levels of combined agricultural and industrial production. As combined interest-rate rises and energy-price increases collapsed levels of production, consumption of non-petroleum raw materials collapsed proportionately.

If raw materials-exporting developing nations had attempted to duplicate OPEC cartels for other commodities, as Henry Kissinger and C. Fred Bergsten proposed, through Unctad and other channels during 1975 and 1976, or as the "Common Fund" was proposed from the same sources and through the same channels later, the effects of OPEC would have been compounded, causing a deeper collapse in developing nations' earnings from cartelized raw-materials exports than has been experienced during the past eight years to date.

The increase effected by cartelized pricing would have merely added to C under conditions $S'/(C+V)$ was already near zero globally, and no *net* investment in new technologies was occurring.

There is a difference between the foolish extremes practiced by OPEC and establishment of equitable prices. We review the matter of equitable, *or parity* prices, and then proceed to the conclusion of our argument on this matter.

The world food shortage cannot be mastered except by establishment of worldwide *parity* prices for agricultural products, prices comparable to 100% of parity price for U.S. agricultural products. Against this elementary economic fact, it is argued that such prices would put food prices above the purchasing power of large sections of the world's population. That latter argument is fallacious, as we shall show summarily. After illustrating the principle for agriculture, we shall extend the application of the same principle to raw materials.

A parity price for an agricultural commodity is not a "subsidized price," not an artificially high price. A parity price is based on two elements: *direct cost* and *capital cost*. The direct costs of agriculture are determined as the average costs incurred by competitively productive farmers. To this is added a gross profit increment, a percentage of the direct costs added to those costs. This gross profit increase covers the farmer's personal income plus an average level of new equity for investment in improvement of agriculture. This rate of accumulated equity is a competitive return on investment, as determined by comparison with nonagricultural products.

If the price paid to farmers falls below that parity price, the result is, first, a lack of equity-investment in development of agriculture, and, at lower price levels, as $S'/(C+V)$ turns negative, a process of collapse of agricultural production.

What has occurred in U.S. agriculture, up to the introduction of "Volcker measures" during October 1979, has been a process through which farmers mortgaged out their farms, to secure replacement operation-capital for the capital lost from selling product below cost. During most years over the past three decades, since the Korean War, the U.S. farmers have lost money on agricultural production. The accumulated result of borrowing of replacement operating-capital has been a loss of farmers' equity to creditors. The combined effect of 1979-rises in petroleum prices and Volcker's tight-money policies has been a collapse of the farmers' ability to secure borrowed operating-capital. Farmers are now going out of production at a rate of about 2,000 farms per week! Under present trends, the United States will become a food-deficit nation by some time during 1982-83.

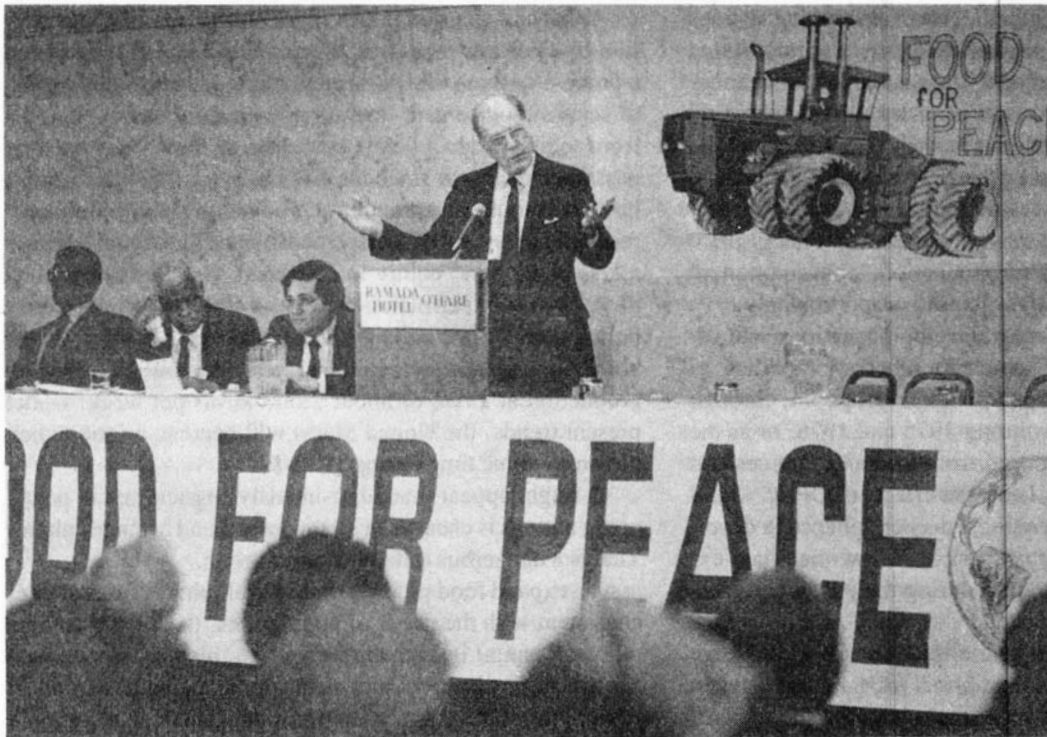
It might appear that labor-intensive agriculture in developing nations is cheaper in direct costs than U.S. agriculture. That is a dangerous fallacy of assumption.

To expand food production in developing nations at rates consistent with the needs of populations, there must be high ratios of capital investment (irrigation, disease control, soil treatment, fertilization, and mechanization). In large parts of Africa, the lack of adequate transportation is an exemplary obstacle to developing specialized market-agriculture in a rational, economical way. The farmers generally cannot support such transport services on present levels of earnings. Therefore, the amount of investment per hectare in Africa must be much larger per unit of present direct cost than in an OECD nation's agriculture. If we compute the rate of required investment for African agricultural land on this basis, then the combined direct and capital costs per unit produced in Africa are comparable to combined direct and capital costs for the United States.

Either the African farmer must receive a parity price, or he must receive productive capital investments in enhanced technologies which add to the same effect as a parity price. If the former, then the developing nations must include a food-purchase subsidy for lower-income ranges of the population as a capital cost added to other developmental costs. If the latter course is adopted, subsidizing technology supplied for improvement of agriculture, the capital cost occurs in this form. The true capital cost is the same, whichever method is used.

The dumping of food on the world market by the British Commonwealth and the United States (predominantly) has thus caused an aggravation of the world food shortage, by creating market conditions under which development of the technology of agriculture in developing nations is undercut. Therefore, the adoption of world parity prices for foodstuffs, combined with a supporting program of subsidies of food-purchase prices over the span of a coming generation, is the only sort of policy which fosters the overcoming of the world's food shortage.

The same principle of parity prices should be adopted for



Lyndon LaRouche speaks at a conference of the Food for Peace group in Chicago, December 1988. "To expand food production in developing nations at rates consistent with the needs of populations, there must be high ratios of capital investment (irrigation, disease control, soil treatment, fertilization, and mechanization)."

products of mining. These prices *should not exceed* a true competitive combined direct and capital cost for such products of mining globally. At that parity price, no true injury is done to industrial production levels globally. Below that price, mining is depleted just as agriculture is depleted by less-than-parity prices paid to farmers. Above that price, the market for mined products is contracted.

Furthermore, the maintaining of adequate capital costs for both agriculture and mining has the effect of reducing the parity cost per unit produced—through increasing productivity by means of technologically progressive, capital-intensive improvements.

There is a proper, calculable price, between the lunatic extremes of "free market" and "monopolistic" pricing. This true price, or equilibrium-price, is the proper *protected price*, to be protected chiefly by treaty agreements among nations to this effect.

Illustration: 'import substitution'

To understand the fallacies of "import substitution" policies, one should concentrate on the earlier discussions of the social ratios. First, we identify the policy itself.

The argument is made, that developing nations should decrease their dependency upon imported consumer goods by importing some consumer-goods manufacturing industries. It is often argued that such imported industries will have the advantage of relatively cheaper labor costs than in industrialized nations, and might even develop as export industries for that same reason of reduced labor costs.

In the main, the result is economic disaster.

Positively, a certain increase in the employed working class is effected, and a relatively more substantial increase of the commercial classes.

When these gains are compared with the situation of the population generally, the warning signs of potential disaster begin to appear. There is very little improvement of the well-being of the farmers, and the effort to keep working-class labor cheap means pressure against farm prices. A side effect of the expansion of commercial classes is an increase of employment in low-paid, unskilled labor-intensive services.

The increased employment in labor-intensive services and incomes of commercial classes are generally increases in the magnitude of d , a potentially inflationary effect. (Since d tends to rise more rapidly under such programs than C or V , $d/(C+V)$ tends to rise more rapidly than $S/(C+V)$.)

A clearer view of the matter is developed by considering the general requirements for development of rural and urban elements of the division of labor.

In order to develop agriculture in a developing nation, we must develop a modern urban superstructure as the instrument through which the transformation of the rural areas occurs. This requires the supply of capital goods of agriculture from urban centers to rural areas. *The emphasis on the capital-goods sector must therefore be higher than in presently, industrialized nations*, in such forms as high-quality steel production and related fabrication, in the development of the petrochemical industry (fertilizers, etc.), and in the development of high-technology energy supplies and transportation.

If we examine the social composition of the labor-force as a whole, we note that the true social cost of producing nutrition and fiber is extremely high, relative to industrialized nations. Therefore, massive introduction of nonagricultural consumer goods into the limited per capita market defined by relatively high social costs of agricultural products must be cost-inflationary. This cost inflation promoted by “import substitution” holds farm prices below price levels required to foster agricultural development, and keeps the farmers generally in relative illiteracy and poverty. The cost inflation depletes the margins of capital funds otherwise available in the form of consumer-goods purchases. In addition, a costly social infrastructure is required to support the requirements of combined imports substitution and commercial development, a cost which tends to outrun the growth of the tax base needed to support such an infrastructure.

The efforts of the state to correct such an imbalance take the apparent form of “economic repression” against that portion of the urban population’s standard of living represented by combined services and manufactured consumer goods. Failing to make the correction sets the impoverished strata of rural and urban poor against both the state and the higher-income strata of the urban population. The ingredients of political-social destabilization are thus set into place.

The developing nation must discourage the marketing of “luxury” consumer goods, focusing upon nutrition, housing, education, sanitation, and health services. To accomplish this politically, the state must foster in the general population consciousness of the realities of agricultural and capital-goods development as the determinants of a sustainable household income level. *The emphasis on heavy industry must be made an adopted policy in the consciousness of the majority of the population.*

There are two particular illusions concerning economic history which must be eliminated from the minds of policymakers and political parties. The first of these interconnected illusions is the myth which proposes that present developing nations can repeat what the victims of this illusion falsely imagine to have been the history of self-development of the economies of presently industrialized nations. The second illusion, fostered by British liars and others, argues that the development of heavy industry occurred as an organic outgrowth of “free trading” consumer-goods industries.

The significances of the two cited myths is fully discovered by examining the truth counter to each. To approach that truth, a preliminary characterization of each of the myths proves helpful.

To compete on the world market, a nation must achieve a productivity equivalent to that prevailing in that category of world trade. Therefore, its urban goods-producing sector must be at least as advanced in social composition of capital-to consumer-goods production-ratios as the most industrialized nations. Since the social ratio of capital goods for agricultural development must be higher than for presently in-

dustrialized nations, the ratio of capital to consumer goods employment must be significantly higher in developing nations for this reason, as also for the reason already given earlier.

We must think of an *initially relatively small (relative to population), but advanced urban manufacturing sector* engaged in rapid transformation of the agricultural sector. As this industrial sector expands, the ratio of capital to consumer goods production must be maintained at relatively high values.

We also think of this policy in correct terms, if we focus on the matter of bringing the overall per capita productivity of the developing nation up to presently industrialized nation standards. This requires a rapid transmission of advanced technologies to the economy, a transmission which is mediated chiefly through the capital-goods sector.

The emphasis must be on heavy (capital goods) industry from the start.

How does a developing nation construct a utilized capital-goods sector on the base of an underdeveloped consumer-goods market? The actual history of industrialization of the presently industrialized nations points the way to the answer.

Let us take as a reference-point Leibniz’s successful development of the steam engine, in collaboration with Huyghens and Papin. (Papin was the first to power a vessel by means of a working steam engine at the beginning of the 18th century. The British lured Papin to England and suppressed his invention. It was the emergence of the Ecole Polytechnique which forced the development of the steam engine—via Carnot’s collaborator, [Robert] Fulton, et al.—almost a century later!)

Leibniz’s work centered, as we have noted, on the principle of heat-powered machines. For his immediate uses, Leibniz emphasized the development of the burning of coal as the heat source to be used. The development of the steam engine was the direct result of this policy.

To secure the coal for the newly revolutionized industries to be created, coal-mining must first enjoy technological transformation. One of the most critical bottlenecks was the pumping of water from the mines (and the related problem of ventilating the mines). Therefore, the initial practical emphasis had to be placed on developing the steam engine as the unique solution available for pumping water from mines.

These conceptions, and related conceptions of the mercantilists and Kameralists generally, were the basis for the industrial revolutions of the 18th and 19th centuries. In each case, the development of the industrial revolution was accomplished through military and other capital expenditures *by the state*. Canals, railroads, improved cannon, the top-down construction of Germany’s metal-working and chemical industries under Kameralist influences, are to be compared with the launching of the industrial revolution in France by Carnot’s forces. It was the same in the United States.

The development of the private-sector capital-goods in-



A Schiller Institute demonstration in Washington, D.C., April 1985.

dustry occurs chiefly through state-funded infrastructural (and military) undertakings. These projects are the initial market for the products of investment in capital-goods production. The smaller capital-goods industries develop, in turn, as vendors to the keystone capital-goods industries. The development of agriculture occurs through the transport of market-oriented rural production to the industrial centers of capital-goods development.

It is out of this evolving relationship between agricultural development and capital-goods development that the proper development of consumer-goods industries occurs.

Once started, after the initial phase, the consumer-goods industries grow relatively in respect of percentiles of employed persons. After this intermediate phase, the proper growth of the ratio of capital-goods to consumer-goods employment reasserts itself in a properly developing economy.

Illustration: logistics of food aid

During the summer and fall of 1980, this reporter and his associates mobilized forces in an (unfortunately unsuccessful) effort to provide adequate food relief for famine-stricken

regions of Africa. In addition to demanding such aid for Africa, specialists associated with our effort worked on the problem of the logistics of food delivery. The problem is well-known to African statesmen, but it is nonetheless worth summarizing the matter afresh in order to situate an important practical point of development policy.

If food could be delivered on time by ships, there are usually inadequate port facilities for handling the food. Once the food were docked, there are not transport facilities to deliver it efficiently to the locations where it is needed. If we employed air transport, we face the problem of transportation facilities for distributing the food from the landing-field sites.

Were I President of the United States, how would I properly handle the delivery of food to relieve famine in those parts of Africa suffering such difficulties? This leads us to the key point to be made here.

I would use the U.S. military's logistical capabilities, supported by civilian means. The leading edge of my effort would be the U.S. Army Corps of Engineers. We would employ wartime varieties of emergency methods to construct ports, roads, and rail systems, and air fields. By constructing the infrastructure required to distribute the food, we would have built a valuable part of the infrastructure which the nation needs. At first, the transportation network would facilitate the delivery of supplies into the interior. This same infrastructure would then be the means for conveying elements of agricultural technology to rural regions. The same network would become the means for shipment of developed market-products from farms in those regions to urban centers.

As part of the effort, I would propose to the nations being aided, that we cooperate to develop that nation's own combination of a corps of engineers and complementary civilian capabilities, to expand and maintain the infrastructure developed.

Where there exist well-defined project-requirements for water-management, transportation, ports, major energy installations, these should be set into motion for early completion in parallel. The requirements of such projects create the market for development of local industries to support these projects. It is wise to selectively promote those kinds of industries for support of such projects which are priority acquisitions for the continuing structure of the national economy after the completion of the specific projects which stimulate their initial development.

This emphasis upon a military approach to initial development of crucial elements of infrastructure should be properly understood.

France's Louis XIV was no echo of Louis XI. Through folly, Louis XIV was manipulated into rejecting the counsel of Jean-Baptiste Colbert, and to embark on ruinous forms of military ventures. Hence, in consequence of the ruining of France in that period, the development of modern military science was set back from the beginnings it had enjoyed

under the inspiration of the collaborators Leonardo da Vinci and Niccolò Machiavelli at the close of the 15th century and beginning of the 16th. Military science was revived under the leadership of Lazare Carnot, and Carnot's reforms imitated both by Germany's Scharnhorst and the West Point of Commandant [Sylvanus] Thayer during the presidencies of [James] Monroe and John Quincy Adams. These U.S. military traditions were revived out of bloody fields of battle during World War II, and have recently ebbed from public view with the passing of traditionalist U.S. military commanders typified by Gen. Douglas MacArthur.

The relevant revolution in military science was initiated, as we have noted, by Lazare Carnot, who developed the modern infantry around the revolution in the geometry of warfare effected with his forced development of mobile field artillery. These changes centered around the principle of logistics. An effective military force is essentially *a logistical capability in arms*.

Civilian examples of the same principles are the U.S. wartime Manhattan Project, which developed nuclear weapons, and the launching of NASA by President Eisenhower. In sum, the intensified, coordinated application of concerted logistical capabilities to an undertaking is the quickest and lowest-cost approach to accomplishing a task.

The importance of this approach does not flow from its putative military origins. Rather, in order to develop a capability for winning wars, it was prudent to deploy the most advanced capabilities of modern technology in an intense, coordinated manner to concerted effect. Military ventures have often promoted technological progress because the winning of wars requires the concentrated deployment of the most advanced technologies.

The development of regions of Africa should be defined in terms of military campaign-style projects of developing infrastructure, and deploying large-scale agricultural-development efforts aided by heavy engineering, as well as putting into place key elements of the nations' energy-production needs and fostering the development of selected key capital goods-producing industries.

The effect we must create is analogous on some points to the temporary employment of labor from developing nations in France or the Federal Republic of Germany. We must bring modern technology proximate to the population generally, so that the population may assimilate that technology where it presently lives, without suffering the concomitants of being a guest-worker in another nation.

There must be other elements, including essential cultural features, for this program. Nonetheless, the notion of the "crash development project" is the bare skeleton on which to suspend the other essential elements.

Notes

1. The author defined the concept of *net work* in the preceding chapter:

"If, as we have indicated, technological progress is the essential precondition for successfully perpetuating human existence at a certain level of average development of the individual, then the fundamental causal relations in society are those centered upon the proper measurement of technological progress: *net increases* in the potential relative population-density.

"From that standpoint, all of the work of society which merely maintains the society at the same level of potential relative population-density is describable as *virtual work*, and does not represent any *net work* by that society. *Net work* is represented by those forms and degrees of technological progress which increase the potential relative population-density."

2. In his most recent book, *The Science of Christian Economy* (Washington, D.C.: Schiller Institute, 1992), LaRouche elaborates his thinking on Marx by a comparison of the "common axiomatics of the economic doctrines of Adam Smith, Karl Marx, and the Emperor Diocletian. . . .

"Since the practice of statecraft must be concerned with the *durable survival* of the society and its included most essential social institutions, there can be no competent statecraft whose practice fails to address efficiently the requirements of a science of Physical Economy. Diocletian's decrees and the physiocrats Adam Smith and Karl Marx demand, on common included ground, that political-economy evade those conditions which are indispensable for the *durable survival* of a society.

"We have indicated, that a transfinite, positive ordering of increase of an entire society's potential population-density is the general precondition for durable survival."

A Leibnizian approach to city design

The "machine" for the effective development of a nation is beautiful cities bounded by fertile fields of modern agriculture. Such cities are the centers of culture and technology for all of the people, including most emphatically the families of the farmers which share the city at the end of a day's or week's work.

This notion has been the central conception for the development of civilization since earlier than the city-state republics of Ionian Greece. This was the policy of Alexander the Great. It was the genius of the Arab Renaissance. It was the guiding conception of the great Platonic cathedral-builders of France. It was the leading conception of Italy's Golden Renaissance. It was the conception revived, with important new specifications, by Gottfried Wilhelm Leibniz during the latter part of the 17th century.

The name which Leibniz gave to a city performing such functions was an "Academy."

We do not propose for African nations the image of the city of Europe or North America today. Nor are we proposing some costly luxury to be added to the list of urgent requirements of hungry people's nations. The concept of the city, properly elaborated and understood, is key to the notion of, and the successful implementation of development otherwise competently defined. The mere fact that this particular conception is poorly known today is not a fault of the conception, but is the fault of the decay in quality of education and moral outlook among the world-hegemonic institutions of the metropolitan nations.

The impediment to discovering the importance of this conception is symptomized most efficiently by those notions of development which portray advancement of the developing nations as a matter of sharing-out of some of the wealth presently concentrated in the metropolitan nations. As a poor man might clothe himself by purchase of garments which a wealthier man has discarded, so mean and arrogant professors and others of the metropolitan nations propose that developing nations must be satisfied to beg for shares at the back doors of the wealthier nations. So, the World Bank was developed as a poor nation's back door of the richer nations' International Monetary Fund (IMF).

In order to discredit that mean and arrogant misconception of development, as "redistribution of wealth" to the poor, let us now concentrate our attention on the alternative to such mean prejudices, before continuing with outline of the principles of the "new city" as the most critical "machine" for economic development.

Two meanings of 'colony'

In former times, before the Hapsburgs and the British East India Company made the term "colony" a name for mass murder, rape, and enslavement, that same word (and its synonyms) had a directly opposite meaning. This older meaning is treated in Plato's writings.

Under conditions where an old nation has become degenerate in engrained habits of outlook and practice, it may be the case that the most efficient approach to saving that decadent old nation is the development of a new nation which selectively embodies the best technological and cultural fruits of the old. So, the decadence of 17th and 18th century Europe was viewed by the Commonwealth Party colonists of North America.

As we noted earlier in this report, during the period of the American Revolution, the population of English-speaking North America had a literacy rate in excess of 90%, in contrast to approximately 40% in Britain. Moreover, the Americans were twice as productive as the British population, and had average incomes twice those of the British.

Contrary to liars such as the pseudo-historian Turner, et al., this relative prosperity of the Americans was not a consequence of natural resources available. U.S. Treasury Secretary Alexander Hamilton is explicit on this matter in his 1791 *Report on the Subject of Manufactures*. There is no permanently intrinsic fertility of agricultural land, for example. The wilderness is a stubborn and dangerous adversary of humanity. Man must conquer and tame that wilderness, and develop the land's fertility through improvements which are the products of man's labor. This evidence of early American history is totally clear and conclusive on this point, entirely supporting Hamilton against both the French Physiocrats and British East India Company agents such as Adam Smith and David Ricardo. Wealth is not determined as the so-called bounty of nature, such as "raw materials." Wealth

is determined entirely, exclusively by the application of the progressive development of the productive powers of labor.

The superiority of the average American over the average British during that century and afterward, was chiefly the fact that the English and other colonists of North America were morally and intellectually superior to the average countryman they left behind in Europe. Contrary to commonplace academic lies, the English colonists did not fly to North America to escape religious persecution in Britain. The colonization project was outlined as policy during the 16th century by Dudley and others. The purpose was to found on American shores a strong republic, free of the decadence of Europe. The development of this republic was to be used as a weapon for tipping the balance of forces against the forces of moral decay and decadence in Europe. A selection of the best parishes of England and other nations was carefully recruited to establish the new colonies.

Just as the republicans of Europe had founded those settlements, so it was the allied forces of the Anglo-American Commonwealth Party (Benjamin Franklin and Joseph Priestley, for example), together with their traditional Colbertist and Leibnizian allies on the continent, which assembled a strategic combination of allied American and European forces, which brought Britain to her knees before the forces supporting the existence of the newly established American republic.

In turn, the American Revolution became the rallying point for a fresh onslaught of European republicans in their own nations. The Ecole Polytechnique of Monge and Carnot is the political exemplification of this reciprocal connection between the development of the American republic and the effort to establish a republican order in Europe.

Today, European civilization, deeply enmired in moral decadence and associated decay, must be renewed. The key to the renewing of the United States and Europe is the development of at least a large number of the so-called developing nations. We must select the best cultural and technological fruits of European progress, and must deliver these fruits to the development of nations in the developing sector. We must build the new nations, not as approximations of the decadence established in the old, but *better than the old*.

The leading industries and universities of the developing nations must become superior to those of present-day Europe and North America. The new cities of the developing nations must be better than those existing today in Europe or North America. The best science practiced in leading institutions of the developing nations must rank among the most advanced science on earth.

The African will find it difficult, perhaps, to accept the present-day practicability of such a policy, until that African places himself in the shoes of a person, such as this reporter, who looks at Africa from the vantage-point of an enlightened true perception of the vital interests of the United States, or a nation of continental Europe. (We have been unable to

discover an influential person with enlightened perception of self-interest in Britain.)

Here I sit, for the moment, in the Federal Republic of (West) Germany, a political figure associated with a collectively influential (and deeply frustrated) circle of the United States. We, of these nations, have the existing or immediately developable technologies sufficient to solve all of our own principal material problems. Yet, because our nations are permeated with decadence and Fabian forms of moral decay, not only are we unable presently to deploy developed technology, but the industrial economy, the agriculture of our nations, and the moral qualities of our citizenries are being systematically destroyed.

What, in such circumstances, is the true interest of my own nation? I reflect: There are these developing nations, many being destroyed by famine, which urgently require the very same technology our own nations are too decadently foolish to deploy at home for themselves. Let us therefore give this best technology we have to those developing nations. Let us select from among our most capable scientists and technologists forces to assist the developing nations in using such technology, and to train citizens of those nations to master and develop further this same technology.

If we of the United States, for example, can but influence our own nation sufficiently merely to cause that flow of technology to occur, this commitment will provide the margin of change needed to reverse the process of decay in our own nation. Meanwhile, the success of this undertaking in developing nations will accomplish a renewal of the vitality of the human race which will benefit the United States (in particular) as the 18th century's American Revolution inspired old Europe.

How shall we finance such exports of technology? By the cheapest-cost long-term credit. If a nation is too poor even to use such credit, then let us employ outright grants over the span of a generation—until that nation is sufficiently developed to afford the credit. If we think of the benefits to world trade resulting over the course of two generations, this will turn out to be the most profitable thing we have ever done.

How exporting nations are repaid

Where possible, the means for financing development of developing nations should be low-cost long-term credits, with grants used for those cases in which the nations are too poor to permit use of loans.

This is to the double advantage of the developing nations. First, since the economic activities (infrastructural projects) of the state are the indispensable prime means for developing such nations, the use of credit for the financing of these long-term state investments provides the state political independence as a sovereign state in its principal borrowing-activities. Second, this enables the sovereign state to shape the flows of credit for private investments within that nation, free



A Schiller Institute demonstration in Washington, D.C. on Jan. 15, 1985. Ten thousand people rallied on Martin Luther King Day to demand food for Africa and the Strategic Defense Initiative for the United States. "If we of the United States, for example, can but influence our own nation sufficiently merely to cause that flow of technology to occur, this commitment will provide the margin of change needed to reverse the process of decay in our own nation."

of the caprices of foreign investments by multinationals.

Since the source of this credit is long-term, if low-cost loans, industrialized nations can provide this credit without being charged by large sections of their own citizens with giving away those citizens' tax-contributions to foreign nations.

The fact that the borrowing nations will repay such long-term loans is not the source of the advantage to the capital-exporting nations. The function of such long-term loans is twofold. Most immediately, such loan mechanisms are the only politically acceptable means for transfer of credit, both in terms of the sentiments of the tax-paying populations of the credit-issuing nations, and the sovereignty of the borrowing nation. Second, such debt, guaranteed by states, functions usefully as a medium of credit within the capital-exporting nation.

The economic gain to the capital-exporting nations is located in the effects of increased high-technology export activity, in fostering more rapid turnover of agricultural and industrial capital stocks in both the exporting industries and industries which are vendors to those exporting industries.

An excellent, recent illustration of the principle involved is the case of the Federal Republic of Germany during the period 1975 to 1979.

During that period the rate of productivity in the Federal Republic exceeded the effects of increased petroleum prices. The chief reason was the flow of high-technology exports fostered by the policies of the government of Chancellor Helmut Schmidt. The turnover of capital stocks promoted

by those exports was the principal “factor” promoting the increase of productivity of the Federal Republic’s economy.

This is, again, the principle correctly emphasized by Alexander Hamilton in *Manufactures*. The sole source of wealth of nations is the *development of the productive powers of labor*.

By exporting high-technology goods, the United States (forexample) increases the turnover of capital stocks, permitting replacement of old capital stocks by technologically more advanced capital stocks. This causes an increase in U.S. national productivity, which increases the wealth of the United States (and similar nations).

The source of ability of the developing, importing nation to pay for such purchased imports is the increased productivity of labor in the importing nation, resulting from productive employment of those imports as high-technology capital stocks.

It should be clear that the same benefit to the importing nation would not occur if the imports were either “luxury” consumer goods, or import of capital stocks for production of “luxury” consumer goods. A developing nation should import consumer goods and consumer-goods productive capacities *only to the degree* that the consumption of those goods maintains or increases in some essential way the productive powers of labor. Only those imports which increase the productive powers of goods-producing labor (directly or indirectly) will lead to sufficient increase in output of wealth to justify incurring loans for such imports.

It should also be clear that both the exporting and importing nations can afford to increase the traffic in high-technology capital stocks as rapidly as the importing nation can put such capital stocks to productive use.

Although a profit on a sale is necessary to commerce, to maintain progressive investment in capital stocks by the seller, the true source of economic gain is not that profit as such, but rather the increases in wealth secured through advances in productivity of the seller, through technologically progressive turnover of capital stocks.

On condition that such policies predominate in practice, national banking institutions of capital-exporting nations can issue relatively unlimited amounts of credit for high-technology exports, and at nominal interest rates. The limit to creation of such credit is defined by the exporting nation’s capacity to produce exports of high-technology goods, and, of course, by importing nations’ purchase of goods produced by such portions of the exporting nation’s national capacity.

Therefore, if the building of a new city in some African nation does in fact contribute to that nation’s growth of productivity in a significant way, it is in the interest of the capital-exporting nation to aid in making that new city possible. Therefore, the notion of creating new cities now is a fully practicable proposal.

This narrows the practical question to that of the nature of the benefits provided by such a city.

The African new city: cost savings

The designing and building of even a single new city designed to house 250,000 persons is a costly investment. Implicitly, we are indicating the early development of a string of new cities throughout the region of an African “common market,” each city with the *capacity* to sustain a population of from 100,000 to more than 2,000,000 persons. This is, indeed, a most costly investment!

Is it therefore too costly an investment to be considered for Africa at this time? On the contrary, *the savings of costs made possible with such cities are savings which relatively poor nations, such as African nations, cannot afford to defer*.

Let us review some of the kinds of savings of cost a modern city provides, and then indicate the reasons a new city is a far less costly investment than efforts to repair an old city.

The most obvious cost-saving provided by a modern city is the advantages provided by the density per square mile of inhabitants. The general facts are well known to everyone who has been obliged to administer or analyze governmental budgets. Nonetheless, it serves a useful purpose to illustrate the nature of the facts here.

How many meters of pipeline must be installed per household for transport of water, sewage, gas, or centrally distributed heat? Consider not only the installation costs, but also the maintenance costs per meter. How many cubic meters of street construction are required to be built and maintained per household? Apply per household costs of construction and operation to public transportation.

Consider also those categories of function whose quality increases with population-density: health services, education, for example. For the same cost per household, we can provide far better services in densely populated centers than in relatively dispersed areas.

In respect to other functions, which are required by only some portion of the population during any interval of time, as well as functions which are necessary to only some percentage of the whole population, many of these cannot be provided economically in any area but a densely populated one. If only less than 5% of a population requires a certain type of function, this can perhaps be provided efficiently within a densely populated area, but not in a relatively dispersed population area.

A further refinement of the same notion is obtained by considering the variety of functions with which a group of households are associated during a day or week. Members of these households have different kinds of employment, and it is desirable to have efficient arrangements for mobility of employment with the labor-force. Other members of the same households are in educational programs. The relationship among these various institutions and households requires optimization of the time required for members of households to have daily or weekly access to the places of such institutions.

These and related considerations can be unified into a single conception: the physical geometry of movement of people and useful things within a functionally interconnected whole.

Even from elementary standards of accounting practice, the only way in which to provide a necessary quality of life at an acceptable cost is to organize the indicated varieties of interrelationships into the form of a city.

Unfortunately, existing cities are unacceptable in terms of both function and effective cost of function. In some cases, an existing city is located with such unique appropriateness that we must rebuild such centers to the effect of correcting flaws in function and operating costs. It would be less costly to build a new city than to repair an old one. In some cases, it is not practicable to replace an old city; in some cases we must accept the higher costs of repairing it. In Africa, new cities are properly the dominant theme of a development effort.

In summary of this immediate point: cities are the least costly instrument for development, and the development of new cities is less costly than rebuilding old ones to make them useful.

Now, let us outline the concept of a new city by means of approximation. First, let us consider the matter broadly, as a matter of architectural policy. After that portion of our discussion, we shall focus on the crucial conception: the notion of the new city as a Leibnizian Academy.

Broad notions of new-city planning

In this next present portion of our discussion of the city, the specification we cite is hypothetical, excepting one of these. That exception is this: *The core of the new city must be an educational complex.* On all other points, our purpose here is to outline a sufficient number of the principal considerations to be included in city design so that the general conception of the design-problem is communicated.

The very center of the city—at least the *functional center* of the city—must be a complex of *pedagogical museums, libraries, and cultural centers* associated with the activities of those museums and libraries. All urban life should be organized around this complex of museums, associated parks, and teaching and research institutions. Naturally, this should include the leading medical services-research center of the entire region of the city and its surroundings.

Let us now contemplate the following hypothetical specifications for our new cities. The hypothetical criteria used for purposes of illustrating the concept here are the result of informed insight into certain of the leading problems of city-design, but are otherwise arbitrary assumptions for purposes of illustration. The purpose of this interpolated exercise is to outline the scope and implications of the policymaking involved.

Let us assume that we have defined two categories of urban centers. The first is a city in the proper sense of the

term's conventional usage: a population center including residential, industrial, commercial, and educational centers. The second is an industrial city, linked in each case to the labor-force of one or more nearby cities of the first category. The link is provided chiefly by a combination of high-density, high-speed passenger rapid-transit services and freight service.

For cities of the first category, let us assume that we have prescribed that each city will be designed to expand its number of inhabitants to a predetermined maximum population, that the allowed city-designs provide for maximum populations of only the following scales: 100,000; 200,000; 300,000; 500,000; 800,000; 1,300,000; 2,100,000.

Let us also presume that we have prescribed that there will be no urban extension into the countryside beyond the prescribed limits of a new city's design. Each will be an urban "island" which is surrounded by (chiefly) modern agricultural fields and forests, and connected to only the most proximate other cities by rail and major highways. So, industrial cities will be set off by intermediating rural area from the relevant regular cities.

Let us assume that we have varied the designs of cities somewhat to take into account the fact that one may be situated on a seacoast, with a harbor; another may be on a navigable inland waterway; another may be landbound.

If it became desirable to have an urban concentration whose population exceeded 2,100,000 inhabitants in capacity, we would place another or two of the specified varieties of new cities proximate to one another, linking them by a dense-traffic, high-speed mass-transit system, as a means of integrating the populations' functioning.

It is not hypothetical to propose that most of our new cities would be situated at either a seacoast, a navigable inland waterway, or an artificial waterway (such as a canal). For the present, and the foreseeable future, the advantages of cost of water-borne bulk and other heavy freight are so considerable that this cost-factor must be observed in all possible cases. This is not merely a matter of the freight traffic in and out of a functioning city. The building of a city is itself a massive problem of logistics. Otherwise, access to large supplies of water for commercial as well as population use is a major economic consideration. Therefore, in building an inland city in a site removed from major "natural" water courses, the construction of canals to that city to provide an additional mode of transportation of freight, as well as a conduiting of water supplies to the city and its surrounding agriculture (perhaps), is desirable.

Furthermore, one of our tasks is the transfer of excess run-off of fresh water from high rainfall areas into arid and semi-arid areas.

It is also not hypothetical to specify the notion sometimes named the "starport" design.

This design has three categorical features:

First, ocean-going, river, rail, truck, and air transport

of freight must be efficiently interfaced to facilitate rapid movement of goods economically from one mode to the other. Although it may not be customary to shift freight from water-borne bulk transport to premium-grade air-freight transport, the industries and other entities receiving and shipping freight are dealing with most freight classifications simultaneously. The consolidation and division of shipments and receipts of the freight transport in and out of a firm or group of enterprises in the same area is a crucial conception of freight management.

Second, to achieve economy in movement of freight, designs of and procedures for handling standardized containers are essential to rapid and efficient handling of freight generally.

Third, the movement and the warehousing of freight are properly treated as a single operation. Freight of less quantity than the capacity of a transport facility (train, bus, car, truck, and so forth) must be consolidated to make economical use of transport capacity without undue delay in turnover.

In the movement of freight (including warehousing) there are a number of premium economic considerations often overlooked.

First, every day freight is between the original shipper and ultimate receiver, that freight is part of *goods-in-process inventory* for the economy. As the ratio of this inventory to an economy's total production rises, the value of that inventory is a capital-factor for the economy.

Assuming that there are 250 regular industrial working-days in a year, each day the whole output of an economy or its equivalent is in transport, is an added amount of capital carried by the economy, in the order of approximately 1/250th of total national output. An average of five days avoidable delay in transport time is therefore 2% of national output carried as a factor of inventory cost, ten days 4%.

We compensate for the varied value of output by moving freight which has the highest value per pound by the most rapid more costly means of transport, and also use the most rapid mode of transport for even relatively low-value items whose late delivery would create a costly bottleneck in production. For bulk freight which has the lowest value per pound, we prefer water-borne transport. For some high-value freight, we use water-borne transport when the costs of alternative transport for that are so high that it is cheaper to carry the extra inventory cost than to pay the alternate increase in freight cost.

In all cases, the rapid transport of freight, including rapid transition at low cost from one mode of transport to another, is a major element of cost-variation for a national economy.

This also applies to inner-city distribution of freight from warehouses in the city. The movement of goods to stores, including daily deliveries of perishables such as foodstuffs, is an important aspect of this problem. (We shall come to that point in this immediate subtopic of discussion.)

Second, smaller communities and small enterprises with-

in cities depend for economic survival on regular deliveries of freight to and from their locations, even when the amount of freight transported is small. This problem was mastered within the U.S. economy during the postwar period by a system of regulated freight transport. Regulated freight charges permitted the integration of trucking operations with sophisticated warehousing operations. Freight was consolidated for delivery to numerous receivers along a route of delivery for an assigned truck, under conditions in which each shipment processed was a small part of the total load of the truck. This efficiency was enhanced by the use of computers.

Under the Carter administration, at the instigation of Sen. Edward Kennedy, "trucking deregulation" was initiated, with the U.S. trucking industry collapsing in both economic and delivery performance as a result. A comparison of 1976 delivery performances in the United States and the Federal Republic of Germany, with the miserable performance of transportation in Britain, shows not only the monstrous effects of the kind of deregulation introduced to Britain years earlier, but shows the importance to the entire economy of the quality of integrated warehouse-transport operations which regulation provided the United States.

Third, as we noted in the conclusion of the preceding section of this report, the single most crippling problem for the economy of most of Africa is the lack of adequate logistics. We must develop adequate logistics at optimal cost and capital outlay. The proposed approach to new-city development, combined with application of the "starport" conception and emphasis on widespread adoption of unitized container methods, is essential on this account alone.

We must concentrate urban activities in a few well-planned centers, and use those centers as distribution points for adjoining rural regions. By linking the relatively few new cities by means of a limited number of efficient transportation grids, using the "starport" conception as a guide to our approach, we can achieve the optimal improvement of logistics with the relatively least investment and over the relatively shortest span of time.

The optimal approach to establishing the new city is to construct a universal *substrate* first. For purposes of imagery, one might think of this as a vaulted honeycomb of tunnels and special other areas beneath the surface of the city.

This substrate will provide ways for installing utilities, for subsurface transfer of freight to locations within the city (preferably in electrically powered vehicles), for removal of waste from the city, for subsurface rapid public transit of people, for options such as subsurface independent passenger vehicle transport, for storage of vehicles. Such a honeycomb should be modular in general design, to permit economical changes of even a relatively radical alteration of technology of transport modes and services during the next century.

The quality we can afford to provide, both for the substrate and structures above the substrate, is largely a matter

of the useful life of the structures and relative costs of maintenance of those structures over their useful life.

The initial investment outlay is reduced by expanding the new city to its full capacity only as that expansion is required, and by governmental retention of title to the land area of the complete city and projected as well as constructed inter-city connecting passageways.

It is urgent to prevent speculation in the value of the land area itself, otherwise acquisition-costs for sites will eat away major parts of the funds dedicated to the finished construction. Africa must prevent itself from becoming the victim of the lunatic real-estate speculation which is the chief driving-force behind the present financial bubble and monetary inflation of the industrialized nations.

The required quality can be provided if we adhere to a policy of placing priority in household consumption on quality nutrition, housing, medical, and hygienic services, and education (including the cultural life of the population as a whole).

We divide the design of the new city into zones. In addition to the central educational region around the pedagogical museums, we set aside residential, industrial, and commercial areas. (The municipal center should abut the central educational area.) Initially, we wish to keep the scale of the commercial zone small.

The case of the medical services requirement illustrates the probable approach to be taken to certain other matters.

It is desirable to integrate a number of functions into residential areas. Schools for younger children, centers for preschool-age children, food stores, and certain forms of medical-service centers, to serve as service-points for routine health services care, and as conduits into the major medical services of the city.

The general problem of design to be resolved is the approach to relatively high-rise construction.

We must desire the provision of apartment-residences in multi-storied buildings with elevators to provide the advantages of economy and population-density. That is basic economy. The problem is to articulate such construction to the effect of providing light, greenery, and a sense of spaciousness at all levels of elevation. We are persuaded that this challenge can be solved economically by architects and associated scientists and engineers. We are also certain that the principles of Platonic ratios employed by the Gothic cathedral-builders, and successfully mastered by great Golden Renaissance painters and other artists, can be and must be applied to the problems of combining function and psychological effect.

It is a lesson of living in and studying cities that a good city is one with a large portion of trees, grass, and other flora pleasing to people, and that this effect can be achieved (admittedly at some cost) at higher elevations of a city's structures. It is also a practical fact that an increased density of such trees and other flora—especially trees and shrubs—

functions to moderate the climate of the city.

It is not necessary, of course, that all of the desired features be completed at once. Just as the construction of the city can converge on its intended design-limits as warranted, the completion of details of the design can be progressive—on condition that those design-features are adequately anticipated.

The essential thing which the citizen of such a city must experience over the course of the city's gradual completion is a sense of ongoing progress, of perfection. The city must be to the citizen a growing organism, a place which is fulfilling its design from year to year and becoming better as this occurs.

With such images of the city in view, many of the schools of the city, as well as elements in the city's health services, should be integrated into the structures of the residential zone. Those kinds of distribution facilities which the population requires for daily purchases, such as food stores, should also be integrated into the residential zone's structures. We should include centers which can perform multiple community functions.

All of these extensions of the service-functions of the city must radiate (in effect) from the feature of the city which defines it as an Academy, the center developed around the pedagogical museums.

To develop such new cities, we begin with the logistical network of both the nations and the common market they form. We plan the cities and that logistical network as one design-conception. The building of the logistical system is the skeleton which we construct first. The cities develop as prelocated nodes attached to that skeleton. The cities are constructed through the logistical system and service that system. The cities, as nodes, service the surrounding rural areas. So, the nation and the development of the nation are integrated as an ongoing process of perfection.

Over 2,300 years ago, at a time in which productive technology was far less developed than it is today, the relatively small military force led by Alexander the Great launched the greatest increase in the number of and connections among cities ever projected before that time, and created in a few years more strategically located cities than have ever been established since in so concentrated a time span.

With the assistance of the industrialized nations, such an undertaking can be accomplished in Africa. It is to the urgent advantage of the industrialized nations to provide that degree of assistance. The project is realistic. It would be unrealistic not to undertake it, considering the prolonged suffering and general risk to humanity should we fail to do so.

The economics of city design

In the light of the discussions in sections §2 and §3 of this report, we can determine facts concerning the development of the nation's population which enable us to predetermine the number, populations, and proper proportions of the

urban-rural population and of the composition of the cities 20, 30, 40 years hence.

We can project the birth rate, and can project with fair accuracy shifts in the death rates for the present and succeeding generations. Of the households of persons under the age of 70 years living 40 years hence, we know generally what percentage of the whole will be engaged in rural occupations, and what percentage in urban occupations.

The industrialized nations must export technology to developing nations, because, at present levels of advancement of capital-intensity in their own sector, the developing sector is the region in which the people to be employed are to be found. On condition that the productive powers of labor in Africa are adequately developed, the industrialized nations need Africa's progress only less than does Africa itself.

Let us assume that the projected rural population for Africa for the year 2021 is 30% of the whole population under 70 years of age. We would tend to assume, therefore, that an additional 45% of the total population labor-force so indicated would be employed in urban goods production, with not more than 15% of that total employed in consumer-goods production other than housing and infrastructure. Perhaps 15% of the total labor-force would be engaged in professional occupations including medicine, scientific research, engineering, teaching, leaving 10% for administrative, commercial, and nonprofessional service categories. These figures are not exact, of course, but they accurately indicate the general relationship among the indicated categories assuming a 30% rural component for the labor-force.

The average incomes of these African workers would be below U.S.-Europe-Japan standards chiefly by the factor of the excess ratio of rural to urban occupations by comparison with the presently industrialized nations of today's categories. It would be sensible policy to establish parity of household consumption with European households in the indicated priority categories of nutrition, housing, hygiene and health, and education and culture. Thus, incomes would fall below European standards only in the remaining categories of consumption.

That adjustment of income-parity by giving priority to

indicated categories is made tolerable by a policy of holding down the expense-ratio for the whole economy in administrative, commercial, and nonprofessional service categories. The inhibiting of the growth of the commercial and nonprofessional service categories corresponds to relative limitation on the lower-priority categories of household consumption.

In urban industrial and related categories, the African worker of 2021 should be approximately as productive as the European worker, and his industries of approximately the same order of effective technology and capital-intensity. He will produce as much, at least approximately, as the European worker, but will suffer a relatively lower income as a result of the lower productivity of African agriculture. (Since he must pay more for food, in terms of effective social cost of the production of food, he compensates for the higher cost of food by buying less of lower-priority categories of household consumption.)

We also know that under conditions of a shift of world policy toward technological development of the developing economies, the general rate of increase of industrial productivity should be in the order of 5% per year or greater. We also know that the energy consumption of industrial production will rise at a greater rate than gains in productivity. We can therefore estimate reasonably (at worst) what the production, productivity, and energy requirements for the advanced sector of today should be for the year 2021.

Similarly, we can project capital-intensity requirements.

These estimates provide us a guide for the standards to be applied to *competitive* industry in Africa (and elsewhere). Assuming that Africa obtains the credit for, as well as maintaining a policy of developing competitive industries, we can project the parameters for Africa's urban population. (What the prices are, we do not care; we need consider only the functions defined in terms of $S'/(C+V)$, $C/(C+V)$, and \bar{W}_s .)

These estimates enable us to project a budgeted set of data for the African urban population for the year 2021. Counting the cities and other urban centers in which this population is located then, we are able to project the proportions of the new cities for that year.

We know the ratio of workplaces in industry to total population, the estimated number of households (living units) into which that population is divided, the amount of energy production the city will require, and so forth.

Now, let us rethink the ground we have covered. Let us assume that the desirable figures for 2021 are not reached. Or, alternatively, let us assume that we do better in development of agriculture than is projected. What happens, in either case, is that we simply adjust the time-scale for rate of completed development of the cities. Such adjustments are feasible provided that the rate of development and proportions of that development are kept within conceptually definable limits.

If the rate of development is too low, then, perhaps, population will exceed potential relative population-densi-

ty—as the Club of Rome desires should occur very soon. If it is permitted that the commercial and nonprofessional service categories expand beyond the ranges we have implied in statements of budgetary goals of 2021, we shall suffer badly from such disproportions.

This brings us once again to the voiced objection of the African who argues, “This depends upon the speculation that the presently industrialized nations will recognize it to be in their own vital interests to provide such magnitudes of flow of technology to Africa.” We have examined that point earlier. We pointed out that the export of technology to such purposes increases the wealth of the exporting nations by increasing the turnover of capital stocks of the exporting sectors of the exporting nations.

Now, we examine that same point from a different vantage point.

If the African critic now agrees that it is advantageous to those exporting nations to support the sale of technology under proposed arrangements, the same African might still argue, “If I concede to you that it is advantageous for the exporting nations to adopt that policy, is this policy the only alternative available to them? Could they not increase their capital-stocks turnover, with the same benefits of increased productivity, some other way—and decide that they do not need Africa’s markets for their technology?”

The answer is—with a certain qualification—that the United States (for example) needs to export such technology to Africa. The need may not be as acute as it is for the life-or-death situation of Africa today, but it is a very strong need nonetheless. The proof is elementary.

The present level of technology is always expressed in terms of the social ratio $C/(C+V)$. This ratio is conditional, of course, on the potential rate of productivity $[S/(C+V)$, not $S'/(C+V)$ for this case], and is associated with a specific value of \bar{W}_s .

This means, however, that the rate at which technology can be sold is limited by the *number of industrial (or agricultural) operatives* which can be employed in use of such capital stocks. C is always a *social magnitude* which corresponds to a rate of production (and, consumption) of capital stocks of a certain correlated technology.

To restate the same point in cruder terms: the amount of profit an industrialist can earn is limited by the number of industrial operatives available for him to employ producing with capital stocks in which the industrialist invests.

To use another crude but relevant illustration. Suppose the United States were to buy high-technology capital stocks from U.S. industries, but to dump the purchased capital stocks into the Atlantic Ocean, rather than exporting them for use in Africa. Would the turnover of capital stocks in the industries producing for export not be the same as if those stocks had been exported to Africa?

This leads us down a slippery path, but leads us to an important conclusion nonetheless. We seem to be arguing

against *grants* for African development, as will be apparent immediately, but we shall show immediately after that that our fears on this account were an illusion.

The export of technology to developing nations, under the terms we outlined earlier, is covered by debts contracted (albeit at nominal borrowing costs) by the importing nations. (Except for exports under grants, of course.) The value of this debt is not that it is a debt. The value of this debt is that it corresponds to wealth-creating assets in Africa, *assets which are increasing in value through useful production*. That is the first difference between exports of technology on credit and dumping machinery into the Atlantic Ocean.

The next degree of distinction to be made is between debts contracted (for example) by African nations for import of useful technology and refinancing debts contracted to the International Monetary Fund, World Bank, or a cabal from the Basel, Switzerland Bank for International Settlements. The debt being refinanced, in the latter case, is the refinancing of a worthless debt—a debt which the debtor lacked the means to pay in the first place. The refinancing increases the debtor’s debt without improving the debtor’s ability to pay the debt the debtor was unable to pay in the first place. (This practice is sometimes represented as the practical wisdom of a prudent leading banker!)

In the case of the debt contracted for technology, the technology, if properly selected and employed, increases the debtor’s production of wealth by an amount greater than the debt service incurred. Provided the rate of interest on long-term credit is sufficiently low, all but the so-called least-developed nations would profit from such an arrangement.

In the latter case, the government or bank which issues the loan has not made a profit (on a low-interest loan). However, the seller has made a competitive profit on the technology sold. This adds to the tax base of the exporting nation on account of that profit, and also increases the tax base, directly and indirectly, through added productive employment in that nation. The government itself benefits from what seems an unprofitable sale in that way. Furthermore, as we noted, the turnover of capital stock is increased in the exporting nation, which results in increase of the wealth of the exporting nation in that way.

Therefore, as we noted earlier, the export of technology on low-interest, long-term credit is extremely advantageous to the credit-issuing nation, provided that the importing, borrowing nation’s economy actually benefits from that import through increased productivity. It is an elementary principle of sound banking, that if a loan is truly to the net advantage of the borrower, it is also to the net advantage of the banker.

This reality is reflected in the value of the debts of the developing (importing) nation as an instrument of credit within the financial markets of the exporting nation. As long as the exporting country creates the credit to support that loan through a combination of tax revenues and participating

lending of savings for the balance of the loan, there is no problem with the expansion of credit for export in this way.

What, then, of the alternate case, in which the technology is exported as a grant. In that case, this grant is a charge against the tax revenues of the credit-issuing nation. Two things immediately offset this burden on the exporting nation's taxpayers. First, this portion of taxation directly stimulates the economy, increasing the profits of the exporting firms and their vendors, and increases the tax base in the same manner as for exports shipped on credit. Furthermore, provided that the technology contributed to the developing nation is adequate in scale and effectively used, that developing nation receiving grants today becomes the next generation's customer for purchasing on credit terms. In both cases, whether on credit or through grants, the exporting nation is developing prosperous customers of tomorrow. Meanwhile, through the accelerated turnover of capital stocks, the exporting nation is increasing its productivity, and thus its national and per capita wealth.

Now, dividing the total C which the exporting nation must export to realize these benefits, by the $C/(C+V)$ characteristic of contemporary technology, we deduce the number of productive operatives who must be employed to put that amount of C into work. Without converting that C into capital stocks of actual production, there is no sound basis for producing it.

Thus, to the extent that the rate of progress of technology is limited, as we shall show now, the modern industrial nation's economy's greatest problem is *a shortage of people!* Without employable productive labor, to transform the wealth represented by capital stocks into still-greater wealth, the profits of the exporting nations would tend to collapse. To have that added productive labor, that productive labor must be created by households of a corresponding larger population. Of course, the people contributed to the labor-force by those households must also be developed to competence in the levels of technology the invested capital stocks represent.

The only alternative (to the same effect) to expanding the industrial labor-force of the world in scale is to increase the rate of development of technology such that all of the newly produced capital stocks could be invested in increasing the capital-intensity of existing production. In other words, the rate of increase of capital-intensity [of $C/(C+V)$] defines the limits of an industrial economy's reinvestment in intensification of its own existing scale of production per capita.

The industrialized nations as a whole must export technology to developing nations, because, at present levels of advancement of capital-intensity in their own sector, the developing sector is the region in which the people to be employed are to be found. The importation of guest-workers by the Federal Republic of Germany is an expression of this.

Therefore, on condition that the productive powers of labor in Africa are adequately developed, the industrialized na-

tions need Africa's progress only less than does Africa itself.

Yet, the African critic has another objection: "If what you say is true, then why do the industrial nations maintain a contrary policy? Are you suggesting that their industrialists and politicians are too stupid to recognize facts as plain as you represent your argument to be?"

In a manner of speaking, we are obliged to admit that the industrialists and politicians of the industrialized sector have been behaving stupidly. I emphasize, "in a manner of speaking." It is not exactly *stupidity*—although we must confess we have met a few parliamentarians in the United States and elsewhere who have proven themselves both sincerely and genuinely stupid. The correct name for what may appear to be stupidity is *ideology*. This brings us back to the topic of section §1 of this report, the pernicious influence of British ideology, most emphatically British irrationalist political economy.

There are few industrialists with whom we are acquainted who would not concede at least the nonmonetary aspects of the summary argument we have given in this immediate section of the report. Clearly, no executive is qualified even in the most rudimentary fashion to direct an industrial corporation unless he concurs with the principles we have outlined, *insofar as they bear upon production itself*. It is in the realm of *monetary* policy that otherwise accomplished and intelligent industrialists often are transformed into wild-eyed, irrational ideologues.

This reporter sometimes thinks of certain industrialists that U.S. labor could be twice as productive as it is today, and could even pay industrialists for the privilege of performing that work, and those industrialists would still insist that the cause of inflation was the failure of employed labor to pay their employers enough for that privilege of working. That is the extreme case, but such wild-eyed ideological nonsense erupts sometimes even from executives who otherwise operate their firms quite successfully. Such is the influence of ideology.

In many cases, there is strong reason to believe that the industrialist who spouts Prof. Milton Friedman's evil sort of nonsense about monetary policy is merely regurgitating foolishness he believes he is expected to be overheard stating, rather than wrong ideas he has concocted through the kinds of mental processes he would employ to direct an industrial enterprise.

Our African critic notes these remarks, but adds: "What you have said is very interesting, but does not really respond to my question. Presume that your economic analysis of the matter is correct and that the politicians and other influentials may have been behaving stupidly. The practical point of my earlier question was: Is there any basis for believing that the present policies to date will be changed over the course of the foreseeable near future? What is your response to that practical point?"

Permit this reporter to give the bleaker prospect first.

There is absolutely no assurance that this stupidity will end in such quarters. The present stupidity, or even worse, might very well prevail over the coming period. As was emphasized earlier in this report, there is no evidence in history to the effect that mankind as a whole has an intrinsic gift of correcting his errors in time to survive. There is no evidence from history which indicates that we might not be presently living out the last few years of human existence on earth. The overwhelming preponderance of evidence adducible from the course of the past decade and a half implies that the human race is virtually finished.

Perhaps, in fact, Africa is already doomed. Perhaps it is too late. Unless IMF "conditionalities" are ended, unless the forces allied with the Club of Rome are crushed, unless the pandemic of irrationality pouring out of Khomeini's Iran and the international rock-drug counterculture is crushed, and unless the forces allied with the Bank for International Settlements are defeated, Africa is already doomed to die of famine, epidemic, and raging, murderous banditry of one sort and degree or another. Either we succeed in moving the world toward the kind of policy recommended in this report, and soon, or Africa's case is utterly hopeless.

If there is any vindictive gratification to the dying populations of such a doomed Africa in the fact, the fact is that the policy which dooms Africa will lead soon enough to the similar doom of those nations which have tolerated the genocidal murder of Africa.

Only after we have faced the fact that the presently hegemonic policies do point toward the self-extinction of our species, are we equipped then morally to undertake what must be done. We must shed from our minds all illusions which console us falsely that, as in some children's story or a Hollywood movie, the "hero" will survive in the end. Only a perception of the fact that mankind might not survive its present folly could clear the mind of childish illusions, and enable us to focus our minds clearly on the means by which such doom of our species might be averted. It is only by way of such clear-headedness that we might succeed in finding a pathway out of this impending doom.

The practical question is therefore better posed in this fashion.

The practical question is whether the reality of looming disaster to civilization will penetrate the perceptions of influential statesmen and others soon enough, and powerfully enough to motivate them to reject the ideologies leading us toward such doom. There are indications that the reality of the situation is being sensed increasingly in some leading circles.

Since 1977, the key force which has prevented humanity from sliding into doom has been the close cooperation between France's Giscard d'Estaing and Chancellor Schmidt. The perceptions and responses of that alliance have been inadequate at many junctures but, on balance, that alliance has been the keystone for every effort which has hindered



A Schiller Institute demonstration in Washington, D.C. in November 1984. "The African critic has another objection: 'If what you say is true, then why do the industrial nations maintain a contrary policy? Are you suggesting that their industrialists and politicians are too stupid to recognize facts as plain as you represent your argument to be?' "

major disaster so far. The replacement of President Carter by President Reagan increases the possibility of positive developments, on condition that this is not offset by some disaster to the Giscard-Schmidt combination. In addition to these relatively positive features of the recent situation, there is a scattering of other useful developments.

The lack of an adequate perception of the danger in relatively positive leading circles is reinforced by the lack of a well-supported clear and adequate alternative set of proposals, to serve as replacement for the ideologies and associated policies which have been steering the world's affairs increasingly over the recent decade and a half.

In sum of these arguments, the proper response is that wishful dreaming, wishful hope that one might stumble pragmatically to survival through one worthless compromise after another, is a danger second only to the evil which wishful dreamers prefer not to see. Only well-founded hope, expressed as *unity around policies which could succeed, if adopted*, is a practical policy under such circumstances as those of the present.

The shock-effect of intensified disaster, the combination of a rapidly deepening global economic crisis and other lunacies erupting now, might awaken a sufficient number of influential forces to a sense of reality. If that occurs, and there is evidence to support the notion that this might possibly be occurring now, and if genuinely alternative policies have been placed on the table as seriously intended options, the

direction of policy would change radically.

In that case, and only that case, would the industrialized nations reflect the perception proposed in the preceding argument for such technology-transfer as a statement of the self-interests of the industrialized nations.

Therefore, the only practicable course of action is to place this alternative option on the table, as is done here.

Before turning to the topic of the Academy itself, we summarize the outline of the economic policy proposed.

The sole source of wealth is development of the productive powers of labor. The realization of the development of human labor depends upon capital stocks consistent with that developed potential skill. Under present trends in technological progress, the industrialized nations generally cannot maintain their economies without massive increases in exports of technology. Therefore, those technology-exporting nations must seek out those portions of the labor-force of developing nations which can be upgraded more or less immediately to productive employment using the more advanced technologies embodied in the capital stocks to be exported from the industrialized nations.

To sustain this market for technology, the limited portion of the developing sector nations' labor-force now able to assimilate advanced technologies must be expanded. This requires directed methods for promoting the development of the potentials of populations on a large scale. Therefore, if the export of capital stocks to developing nations is to succeed, there must be an accompanying twofold investment in the infrastructure of the developing nations. There must not only be a development of infrastructure to support the industries initially developed. There must be a massive development of the infrastructure needed for development of the population of developing nations more generally.

Under that policy, the very population of the developing sector which the Club of Rome proposes to murder is the greatest asset of not only the developing nations themselves, but of the industrialized nations desiring to export technology to those nations.

Every infant born in any part of the world has the potential for development of his or her mental powers to the level sufficient for adult competence in use of modern technology. That child can achieve at least an approximation for practice of the highest level of productive powers of labor in the world generally today. It is that potential development which is the only source of wealth, and only that development is a credit-worthy asset in the eyes of a truly prudent lender.

Yet, our justified enthusiasm for the potential of that infant, that child, is based on the knowledge that there exist practicable approaches which can develop such potentials even in the children of an illiterate, oppressed population. That enthusiasm is justified only to the extent that we build into the process of development the machinery which can catalyze a realization of that child's potential.

What occurs at the point that economic development had

absorbed most of the available population of the world? By that time, we must have increased the rate of development of technology such that we no longer depend upon expansion of the economy in scale. The long-term objective of the process of transforming the developing sector is to use the rapid turnover of capital stocks associated with development to increase the institutionalized rate of technological progress to the level we shall require once the two generations or so of transition to the new world economic order have been completed.

The Academy

The driving-force for the development of society is science in the sense we have defined *science* earlier. It is the mastery of the lawful composition of the universe, as we prove such mastery through technological advances correlated with increases in the potential relative population-density of society. The problem of organization of society is the problem of integrating the whole development and practice of the society around the highest levels of progress in scientific knowledge defined in that way.

It should be adequately clear at this point that neither Leibniz nor we intended the rule of nations by a "technocracy." A better name for science might be *statecraft*, a unity of method of outlook of the development of morality and scientific practice. It is otherwise what the term *politics* ought to come to mean.

The most efficient connection between the developed knowledge of the scientist and the mind of the child of a poor farmer or unskilled or semiskilled laborer is a device called a *pedagogical museum*.

A pedagogical museum is roughly described as a collection of historically ranked exhibits of the crucial features of development of a branch of technology. By branch of technology, we might mean productive techniques, we might mean the development of projective composition of paintings during the Golden Renaissance, or exhibits which demonstrate sensually the development and principles of the well-tempered system of musical composition.

For purposes of illustration, let us focus our attention now on a particular one of several alternative task-orientations of a particular variety of historically ranked exhibit. Let us think of an exhibit designed to reach the mind of the child of a poor farmer or unskilled laborer, a child of perhaps between 10 and 14 years of age.

The exhibit might represent the development of the steam engine. It might trace the development of man's knowledge of the electromagnetic plasma, beginning with a repetition of William Gilbert's 16th-century discovery of a magnetic plasma in the flame of a candle. The exhibit has the function of imparting to a child who spends perhaps an hour going, step by step, through the successive levels of historical development of that technology, a conception of the field of technology, and also a conception of that knowledge as some-

thing which has been developed through successive crucial discoveries.

The functions of the pedagogical museum for such children are to impart broader general knowledge to a large portion of the children visiting the exhibit, and to aid a child attracted by that subject in gaining further knowledge of the same subject. Furthermore, a parent who accompanies the child through such an experience shares the child's experience of gaining knowledge in that way. This strengthens the parent's knowledge.

Such pedagogical exhibits, developed by the most gifted pedagogues and technologists, supply schools with proven methods for efficiently communicating the same subject to students. The improved teaching of technology with aid of experimental exhibits is radiated from the museum into the school system generally.

The maintenance and servicing of such a pedagogical museum is properly the function of centers of higher education and research. So, in these and related ways, the pedagogical museum serves as a catalytic connecting link between the general population and the most advanced knowledge of that technology.

The pedagogical exhibits in agronomical subjects are of direct importance for improving the knowledge of farmers, and of strengthening the farmers' interest in and acceptance of technological innovations. The same staff which manages such an agronomical program in a pedagogical museum would also naturally be responsible for demonstration and experimental work performed in rural areas adjacent to the city.

Just as the pedagogical museum pertains to agriculture's needs, it pertains to the industries of the region.

In the same way, the pedagogical-museum staff responsible for exhibits concerning the development of the concepts of composition of paintings and music are properly responsible both for educational programs in those fields, and for coordinating musical, and other related cultural activities in the theaters and so forth situated in the same general educational zone of the city.

Around this, the development of the educational zone as a university follows.

In turn, in the same general manner illustrated by these samplings, the educational zone penetrates deeply into every aspect of the life of the city and surrounding rural area.

The educational zone developed around the kernel of the pedagogical museums is not merely a teaching machine. It is a research activity. The production performed in the industry and agriculture of the surrounding region, added to experimental workshops, becomes the laboratory of practice for much of what is studied and taught. To give vitality and direction to this process, the educational zone of a new city must be engaged in some aspect of scientific research which is of world importance.

Herein lies a vital principle of development.

The development of "developing nations" demands es-

cape from a national self-image of assimilating *only* technologies previously developed by other nations. A modern nation has achieved true sovereignty in spirit only if it achieves excellence in some important aspect of advancement of human knowledge generally. A people which can point to several institutions of its own nation, and can identify several important contributions to human knowledge associated with such institutions, is a people which knows that its children are capable of equaling in importance to humanity the children of any other nation.

Otherwise, as we have indicated earlier, true knowledge is not a collection of "facts" and "formulas." Each scientific revolution, we noted, supersedes whole masses of supposed "facts" and adored "formulas" of the previous period of scientific achievement. What endures in value once an old science has been overturned by one or two subsequent scientific revolutions, are not the "facts" and "formulas" associated with that old development of science. What survives are *the principles of successful discovery* by which successful successive scientific revolutions were accomplished.

To teach science is to teach the principles of discovery. To teach discovery, one must experience and know discovery as one's own experience of achievement. What is important in a truly great scientific institution is not *what* it discovers, but that it *does* discover. It is that latter which imparts vitality to an institution.

In the same sense, we make a mistake if we imagine that the development of the productive powers of labor to a certain degree is a matter of the specific facts and habits of practice which the workman has learned. There could be no more certain cause for costly failures in an industrial plant than a labor-force whose abilities are limited to what facts and habits of practice they have learned. The first variation from the conditions of production consistent with such limited facts and habits, and such workmen would stubbornly fail to perform successfully.

The secret of production is the disposition and capacity of the ordinary workman to innovate successfully. The workman innovates on the basis of a certain level of experience, training, and developed skills—that is true. However, he innovates from that starting point of reference. He does not innovate to change the product in defiance of quality specifications. He innovates to overcome those variations of the conditions of production which prevent him from achieving the prescribed quality of result merely by standard, learned methods and procedures. He innovates to bring the result into agreement with the prescribed quality. Without that disposition and competence for innovative problem solving by the workman, a firm cannot hope to compete successfully.

The essence of the development of the productive powers of labor is the development of a disposition and capacity *to discover*, and to recognize what is and what is not a valid discovery. As mankind progresses from a relatively lower to relatively higher level of productive powers, the essential

feature of the change is *an increase in rigorous powers of discovery*.

The great obstacle to be overcome is exemplified by the hypothetical case of the farmer who refuses to improve his methods of production, arguing that he adheres to the methods used by "my father and his father before him." Unfortunately, such obstacles are not merely hypothetical. This is the problem we must overcome. We must break through such walls of stubborn adherence to habits just because they are habits, and impart to the individual a sense of discovery, of progress.

The stratum on which that effort is focused with the greatest relative degree of success is the children and youth. If the children and youth assimilate the notion of progress, of discovery, that will aid greatly in moving their parents to acceptance or at least toleration of changes. The emphasis must remain on the fact that two generations of youth must be educated before the baggage of generations of illiteracy and oppression can be made a mere memory of the past.

The new city, developed around the organizing influence of its educational zone, is the machine for effectively transmitting development to both urban populations and into the surrounding countryside.

The role of the elite

The term "elite" too often signifies a privileged caste, a caste which gratifies its personal greed at the expense of society more generally. The alternate significance of "elite" is a dedicated body of servants of society, a stratum of persons who have been developed in knowledge and moral outlook to approximate the qualities Dante Alighieri describes in the "Paradise" canticle of his *Commedia*. It is of that latter variety of "elite" we speak now.

The continuing essential problem of organizing society into forms fit for human habitation is centered in a predicament examined most closely—in extant literature—by Plato and Dante. The human population exists in a condition of assortment of its members among three categorically distinct varieties of moral world-outlook. From the lowest to highest of these three ranks, Plato's Socrates borrows from a Phoenician myth to label the three respectively *bronze*, *silver*, and *golden* souls. These are, respectively, the essential moral outlooks Dante treats successively in the "Inferno," "Purgatory," and "Paradise" canticles of his *Commedia*. If for no other reasons, the treatment of this problem by Plato and Dante would prove them the two greatest known masters of statecraft in literature today.

The lowest moral level of humanity, the *bronze* souls, the inmates of the "Inferno," is characterized by those persons who have rejected the moral implications of individual mortality. They flee into hedonism, governing their conduct by the persuasion expressed by Thomas Hobbes, that society is a state of "war of each against all," each seeking momentary gratification of what he perceives at that moment to be

his "inner psychological needs." Since the hedonists reject any rationality above the dictates of pleasure and pain, as do Bentham, John Stuart Mill, and the modern existentialist and structuralist ideologues, they are *willfully irrational*.

This willful irrationality is what is termed "human nature" by the British. It is their, British nature, but it is not human in a *moral* sense of human.

The highest level of humanity, the *golden souls*, the inhabitants of "Paradise," are those who have accepted fully the implications of the moral reflections on mortality. These persons do not locate their self-interest in their mortal passions; they locate their fundamental self-interest in the development and implementation of their powers to bequeath a benefit to the span and duration of posterity. They defend a self-interest of their individual persons only as that person's development and capacity to act for posterity's benefit is the mortal instrument of their higher self-interest. They act in the realm of the living mortals, but their identity is located in the span of the generations of others like themselves in dedication, who have preceded them and who—if humanity does not destroy itself—will come after them to continue that work.

In between these two conditions, and sharing a contradictory portion of the qualities of each extreme condition, one finds the majority of the moral citizens of a civilized nation. On the one side, their hedonistic side, they are motivated from moment to moment chiefly by pursuit of desire for what Dante describes as "earthly paradise." Their day to day goals are their passions, their desire for status, and so forth. Yet, unlike the irrational, immoral British, these citizens are constrained by conscience to wish to do nothing contrary to reason, nothing contrary to the well-being of their posterity.

The associated flaw of these residents of "Purgatory" is that they are what Friedrich Schiller described as "little people." Their knowledge is focused upon their immediate family, neighbors, and friends, upon their success in employment. Fixed principally on such little matters, their minds are made too small to encompass important matters of policy. What they do not see or feel in their immediate environment, they do not know, and they are generally incapable of thinking further ahead in time than a relatively short distance beyond the tips of their noses.

They are intent to be rational and moral, but their minds are too shrunken in scope of interest to assimilate any but the smallest facts. Hence, they are ignorant of morality in a rational form. They know morality chiefly as precepts which they have assimilated into their consciences, precepts which are the shadow of morality, but not its substance.

Concerning strange and distant affairs, they are predominantly ignorant, incapable of assimilating as beyond the little matters which concern them in day-to-day practice. Therefore, concerning things they do not know, which appear strange to them, or which occur in distant places, their opinions are echoes of the most recent gossip they have learned from a person they consider a friend or whom they consider

to represent importance, authority.

A society based predominantly on citizens who correspond to that state of Purgatory may survive and progress, on condition that the "important personages" to which the little people look upward for authoritarian gossip on distant and strange matters are themselves properly informed, or those persons esteemed to be important are members of the elite stratum of residents of "Paradise," are *golden souls*.

As Plato emphasized, the possibility of establishing and maintaining a successful democratic republic required that the republic be guided by the influence of a dedicated elite of *philosophers*, by the *golden souls* of Socrates' Phoenician myths. The moral forces of society must predominate over the immoral hedonists, which requires that the *silver souls* be guided on strange and distant matters of policy by the influence of the relatively tiny elite of *golden souls*.

Such a golden soul is both a *patriot* and a *world-citizen*.

A golden soul must be an unswerving *patriot*, since the only effective instrument for self-government of mankind is the sovereign nation-state. He must defend his own nation-state's sovereignty and true self-interests at all costs. There his principal duty to humanity is concentrated, and the principle of the sovereign nation-state must be defended in each national republic's instance on behalf of the defense of this principle for the sake of all humanity.

A golden soul is also a *world citizen*. It is among the generations of *golden souls past and future, as well as present, that the golden soul finds his or her own primary, higher personal identity*. From this vantage-point, the development of all peoples, all individuals, is his or her responsibility. Each sovereign nation-state is, in that respect, his or her responsibility, just as the development of new sovereign republics where none exists is his or her duty.

There is no conflict between these two commitments.

The *idea of a conflict* is a product of the pernicious influence of British irrationalism. To British philosophy, as to the vile Milton Friedman, a nation is merely a collection of individuals, which ought to tolerate the burden of no higher common moral purpose than the "free market" in hedonistic pursuit of heteronomic pleasure and pain. Just as British philosophy defines a nation as a Hobbesian "war of each against all," so that same wicked philosophy defines nations as hedonistic egoisms, "each" implicitly "in war against all." Hence, for wicked philosophers, such as those, the interest of the state is whatever capricious whim has episodically seized the impulses of this or that ruling circle of a nation, and patriotism in such a nation is dutiful service on behalf of that whim.

With the true republic, matters are defined differently.

All nations are properly under natural law. If republics are wise, they construct their constitutions in such a fashion as to create powerful hindrances against the imposition upon the state of some wicked episodic whim of a ruling circle or a misguided electoral majority. A state ordered according to

natural law has no conflict of fundamental self-interest with any other republic ordered according to natural law.

A true republic, as President Charles de Gaulle defined a proper republic of France, constitutes itself not as a collection of individuals, but as a nation ruled by a perception of and commitment to some special contribution to humanity as a whole. Through such a state, the individual citizen's efforts are provided efficient expression as a contribution to the moral purpose of his or her nation. Otherwise, the function of the republic is as we summarily described it earlier.

The development of Africa, like the successful establishment of the federal constitutional republic of the United States during the last quarter of the 18th century, requires two special forces working on its behalf. It requires a commitment by an international network of persons at least approximately *golden souls* who are dedicated to the successful outcome of the undertaking. It requires, in Africa itself, a force akin to Benjamin Franklin's fellow-conspirators inside the American colonies and young republic. This latter must be a developed republican elite, akin to and part of the international network which aids its enterprises.

The development of such an elite for Africa requires an ongoing process of development of promising youth, youth detected to be potential candidates for the future generation of Africa's *golden souls*. These must be educated according to the same principles we have indicated for the work of the Academy form of the proposed new cities of Africa. By developing in them the outlook and other qualities they must in due course impart to others, we produce the elite needed for the successful development of the new cities.

At present, Africa suffers from the fact that too many of those young persons going abroad for education prefer to remain abroad. Three measures are needed to shift such a trend.

1) Rather than permitting continued emphasis on the notion that the best education is to be found abroad, we must develop several of the best educational institutions in the world in Africa itself. The process of development of several new cities is the optimal circumstance for situating several of the needed qualities of universities in the educational zone of areas in the process of being developed as new cities.

2) There must be a concerted effort to recruit members of a future elite from among Africans resident abroad as students or young working professionals.

3) A unifying conception of the exciting development of Africa, a sense of the privilege of performing a part in this development, must be developed and promulgated as a means of rallying talented persons, that it will be a more worthwhile and joyful thing to build new nations in Africa than to pursue the dubious "earthly paradises" offered in jaded, morally decaying pleasure-pens of Europe and North America.

These three points are, of course, an underlying theme of this present report.

Develop Africa's vast food potential with great projects

by Marcia Merry

The last decade of this century opened to see hunger spreading in Africa through mass "famine belts," on a continent practically made-to-order for agriculture. In 1991, the World Food Program estimated that 30 million people needed emergency food relief in Africa; in 1992, the figure was 40 million. This includes the 4 million in Somalia, and 19 million in the Horn of Africa overall.

Estimated requirements for the continent as a whole, excepting Somalia, are (in metric tons):

Cereals: 486,000 per month; 5,832,000 per year

Pulses: 93,270 per month; 1,119,240 per year

Milk powder: 30,690 per month; 368,280 per year

Fats and oils: 29,460 per month; 353,520 per year

Total: 639,420 per month; 7,673,040 per year

The food shortage does not stem from lack of agricultural potential, nor even from drought, floods, or other weather disasters. The continent boasts some of the most outstanding "natural food belts" on the globe—for example, the nation of Sudan. If advanced farming methods and a food reserve policy were put in place, not even such disasters as the "drought of the century," which hit southern and eastern Africa in 1992, could cause such devastation. The decline of food output is the result of deliberate blockage of agriculture infrastructure and technology development.

The prerequisite for expanding output of food is to expand energy inputs per unit area of production, and/or to bring new areas into food production. For example, if the inputs per unit area of sorghum in the 50 nations of sub-Saharan Africa were comparable to the United States, then instead of the current level of 14 million tons of sorghum produced annually in this region of about 17 million hectares, about 63 millions of tons of sorghum could be harvested—a 70% increase! (U.S. average yields are 3,400-4,000 kg/HA;

African yields are 800-900 kg/HA.)

The low yields in Africa directly reflect the low inputs per hectare—fertilizer, pesticides, mechanization, irrigation. The average fertilizer input per hectare in Africa as of 1990 was about 11 kg/HA, in contrast with a U.S. average of 95 kg/HA. Over the last 20 years, the index of food output per capita has fallen sharply from 110 in 1970 (based on 1980 as 100) down to 90 today.

Cash crops cause ruin

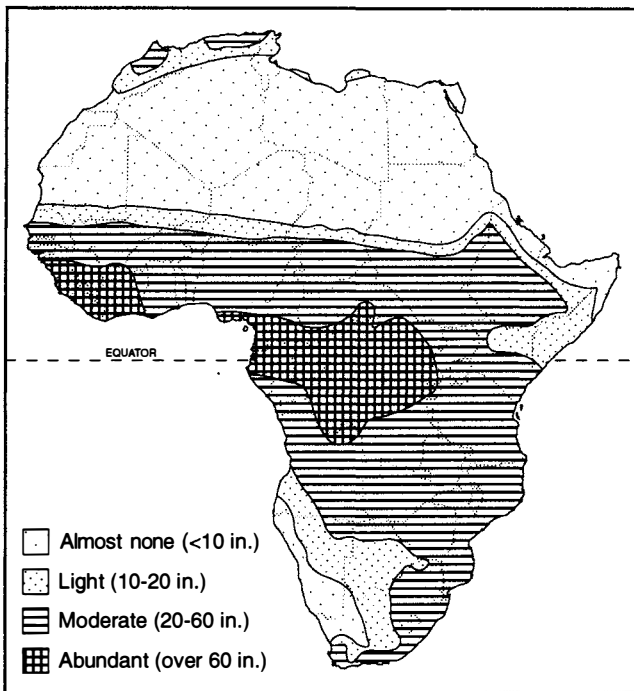
Historically, agriculture infrastructure and inputs have been provided in Africa only for the crop areas and crops favored by the colonial powers: cash crops. At the same time, primitive methods were continued for cultivating food crops for the local population. Occasional food surpluses for export were realized only in North Africa (small grains and rice) and South Africa (corn).

One example of this is in the Gezira District of Sudan, where Africa's largest zone of irrigated agriculture is located, south of the Nile Valley in Egypt. The British colonial agriculture policy for Sudan was cotton production for export. When Sudan gained independence in 1956, there was not one single research station concerned with food. In 1925, the British started the Gezira irrigation scheme—devoted exclusively to cotton. The entire period of British control, from 1898 to 1956, was characterized by lack of improvements in crops and livestock, and low food output productivity.

As of 1970, Africa's share (by value) of world exports averaged 80% for cocoa, 58% for peanuts, 54% for peanut oil, 51% for sisal, 37% for palm kernels, 27% for olive oil, and 27% for oranges and tangerines. Other significant cash crops included coffee, tea, cotton, wine grapes, sugar, and bananas.

FIGURE 1

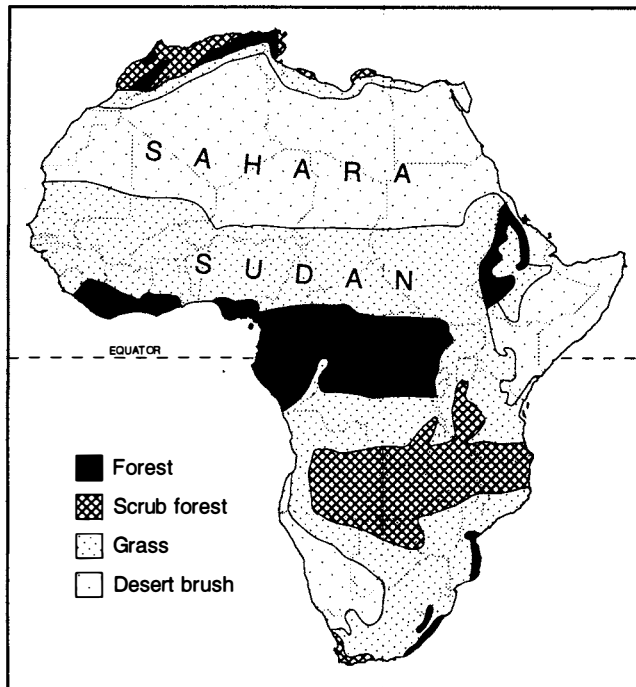
Relative rainfall in Africa



Source: George F. Deasy, et al., *The World's Nations*, New York: J.B. Lippincott, 1958.

FIGURE 2

Types of dominant natural vegetation in Africa



Source: George F. Deasy, et al., *The World's Nations*, New York: J.B. Lippincott, 1958.

The physical geography

The maps show selected features of the physical geography of Africa, giving an idea of the vast agricultural potential. There is a notable absence of rugged mountain chains; most of the continent is an upland plateau, with an elevation of 660-3,000 feet in the north, and 3,000-6,000 feet in the south, edged all round by a coastal strip, and no piedmont.

There is extensive arable land. Out of a total land area of 2.13 billion hectares, an estimated 970.2 million is potentially useful for agriculture—172.3 million hectares of arable and permanent cropland, and 797.9 million hectares of permanent pasture. For comparison, South America's total land area is 1.753 billion hectares, with 116.2 million hectares of arable and permanent cropland, and 447.3 million hectares of permanent pasture.

Figure 1 shows the relative amounts of rainfall. The Sahara and the Somali-Ogaden Deserts stand out prominently in the north for "almost no" precipitation, along with the Namib Desert in the far southwest. However, under much of the Egyptian and Libyan deserts, and also in the western Sahara, are water deposits of significant quantities, some dating back to riverbeds of 5,000 years ago. Remote sensing from satellite overflights has located many such potential aquifers. Though much of the water is "fossil water," and not being replenished by rainfall, still the natural underground

reservoirs could have a role in a transition period, probably 50 years or less.

A broad band of moderate rainfall of 20 to 60 inches sweeps across west Africa, to central Africa and southward. Depending on the terrain and seasonal distribution of the precipitation, these amounts are favorable to a wide variety of rainfed crops.

Finally, this moderate rainfall zone is banded by lighter rainfall along the north, northeast, and southwestern edges, and in the center, shades into the heavy rainfall belt in the heart of Africa—the huge Zaire (Congo) River basin.

Figure 2 shows the dominant natural vegetation types and gives a profile of agriculture in each regime.

Figure 3 shows the rivers and lakes of the continent. In volume, the Zaire River ranks second only to the Amazon River. Africa has 4,184 km³ of total run-off, of which only about 3% is "withdrawn" for various uses, for an average per capita utilization rate of 244 cubic meters annually. In contrast, North America has a total run-off of 6,945 km³, with about 10% withdrawn for utilization, giving an average per capita use rate of 1,692 cubic meters. Except for the lower Nile River, very little of the other African river systems have been developed to their potential for productive use.

Reflecting these geographic features, there are four main

1993 food relief to Somalia—two months' worth of rations for 4 million people. Already 15,000 tons have been delivered by Sudan to the World Food Program.

Great projects for agriculture

The case of Sudan, and a short survey of the four main economic regions of the continent, all point to the necessity of great projects for agriculture development throughout the continent. Providing reliable water, high-energy inputs per hectare, and transportation, in the unique physical conditions of Africa, will yield spectacular results. Here are the specific projects:

River systems development. The Jonglei Canal should be resumed and completed as early as possible. The interbasin development of Lake Chad and the Zaire River system (Ubangi water diversion) must proceed (see map, page 73). The development of the Niger, Zambezi, and other river systems must proceed.

Oasis projects. Nuclear-powered seawater and brackish water desalination facilities must be located at strategic points on arid coastlines—the Mediterranean, Red Sea, Gulf of Aden, Indian Ocean—to create the basis for “agro-nuplexes,” where large communities can live and work with the abundant power and water for agriculture, food and farm chemical processing, and industry. This is critical for Egypt, where over 97% of the currently available water—the Nile River flow—is utilized. Much of the desert between Cairo and the Suez Canal can be readily transformed into arable cropland, with only the supply of adequate water and power.

Advanced technologies. Modern irrigation techniques—trickle, drip, hydroponics, and aeroponics—growing plants under environmentally controlled conditions, are essential for certain arid parts of Africa, such as Egypt and Somalia. Irrigation allows standard yield increases of at least four times; and hydroponics can allow up to 100 times more yield per surface area. Except in Sudan, in southern Africa, and a few other regions, many of the soil types on the continent are leached and poor. Advanced soil-less agriculture can circumvent this limitation. Successful tests have been done in South Africa for hydroponic fodder factories to maintain sheep and dairy herds.

Food irradiation. This method of preserving food, especially animal protein, could begin to bring diets up to needed nutrition levels, even before the continent is fully electrified. In hot or tropical areas, over half of many crops is lost to pests and decay; this can be stopped by irradiating the food for storage.

Fishing fleets and port facilities. Rich fish potential exists off the coasts of much of Africa—for example, the Gulf of Aden; but only the fishing off the coast of South Africa and west Africa has been utilized. Fleets of large fishing vessels, and port facilities for handling and preserving the catch, need to be developed as part of the great projects that can transform the resource continent.

Railroads needed for industrialization

The following material is excerpted from a chapter appearing in The Industrialization of Africa, a book issued in 1980 by the Fusion Energy Foundation Wiesbaden, Germany, and New York, U.S.A. The book detailed a program for constructing a system of 164 new nuclear-powered African agricultural and industrial centers, or “nuplexes,” which by the year 2000 could be serving as the drivers for bringing the entire African continent up to U.S. or western European economic standards.

Unfortunately, the policy was not adopted, and in the 13 years since the book's publication, the condition of Africa's infrastructure has grown far worse than it was in 1980. Indeed, in April 1987, the Fusion Energy Foundation was forced to shut its doors in the United States because of a lawless bankruptcy action brought by political forces bitterly opposed to the policy of industrializing Africa and the rest of the Third World.

In terms of its structure, the present African railway system has hardly gone beyond that inherited from the colonial era, as a brief glance at **Figure 1** indicates.

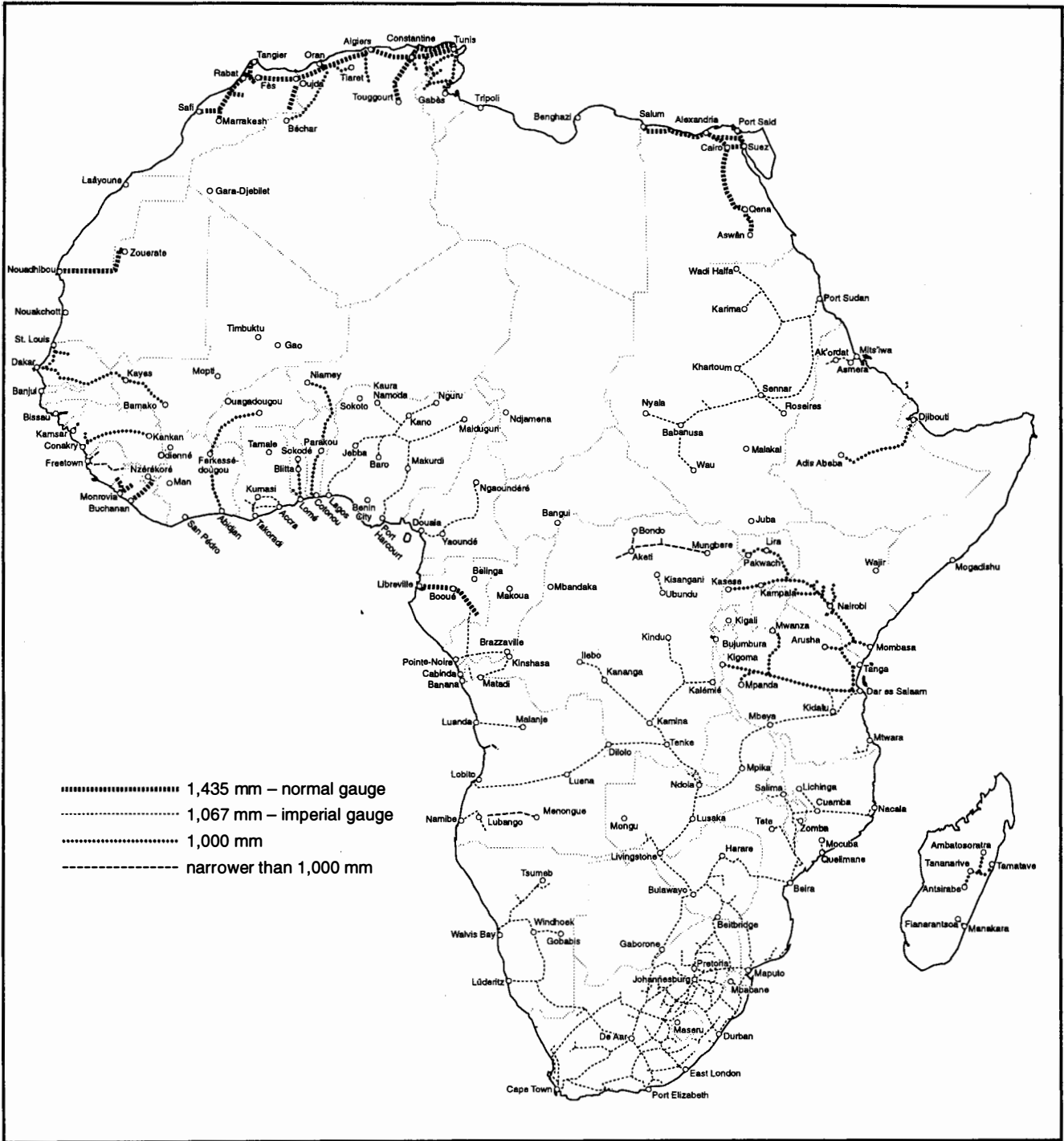
1. No interconnected railway network exists. As a rule, the individual lines run from the coast inland, according to the economic conceptions of the former colonial masters, who looked upon their colonies as mere suppliers of raw materials. This situation is particularly grotesque in West and East Africa, while South Africa, and, to some extent, North Africa, have an actual network.

2. The present railway system is over-aged; about 90% of the lines were built during the colonial period.

3. Track widths differ, depending upon who the colonial masters were. **Table 1** summarizes the relative distribution proportions of these various systems. Such variations in track width (gauge) naturally make construction of a unified African railway network extremely difficult. Additionally, 85% of the entire network consists of narrow-width track, which may have been adequate, at the lowest possible investment-costs, for raw materials transportation, but which are completely inadequate for a developing industrial economy.

4. Another severe problem confronting today's African railways is the result of hidden “recolonialization” by institutions such as the International Monetary Fund (IMF) and World Bank. Lack of investments, due to restrictive financ-

FIGURE 1
The state of African railways in 1990



Sources: Fusion Energy Foundation, *The Industrialization of Africa*, Wiesbaden: Campaigner Publications, 1980; *The Times Atlas of the World*, New York: Times Books, 1990.

TABLE 1
Size of Africa's railway system in 1980

Gauge	Track width (mm)	Length in use (km)
Imperial	1,067	52,000
Normal	1,435	13,000
Meter	1,000	15,000
Other	<1,000	1,000
Total		81,000

Source: Fusion Energy Foundation, *The Industrialization of Africa*, Wiesbaden: Campaigner Publications, 1980.

TABLE 2
Railways of selected countries

Country	Network length (km)	Network density	
		km/1,000 km ²	km/1 million inhabitants
Africa (without South Africa)	59,000	2.7	150
Zaire	5,200	2.5	200
Nigeria	3,500	3.8	45
West Germany	31,600	127.0	510
U.S.S.R. (without Siberia)	134,000	11.0	520
France	37,000	67.0	710
Czechoslovakia	13,200	100.0	890
United States	320,000	35.0	1,400

Source: Fusion Energy Foundation, *The Industrialization of Africa*, Wiesbaden: Campaigner Publications, 1980.

ing and debt-service policies, has led to accelerating disintegration of infrastructure in large parts of Africa, especially disintegration of the railways. With the exception of Southern and Northern Africa, and some countries in tropical Africa, the railways have deteriorated to such an extent that hardly any regular transportation can be maintained.

5. The last problem is a simple one: Underdeveloped Africa has too few railways, as the comparison with industrial nations shows (Table 2). The present average track-density of 700 km per 1 million inhabitants in Europe compares with 150 km per 1 million inhabitants in Africa. This comparison becomes even less favorable when one considers that lines in the industrial countries consist of two or more tracks, while, as a rule, in Africa they are only single-track. The resulting contrast between 1,400 km per 1 million inhabitants in Europe to 150 km in Africa illustrates the actual size of the gap which has to be closed.

The first problem to be solved is that of *different gauges*.

TABLE 3
Main proposed international railway lines for Africa

Line	Route	Length (km)
Trans-Sahara	Fès-Béchar-Niamey	2,700
Atlantic Line	Makurdi-Douala-Kinshasa-Luanda-Windhoek	4,000
Trans-West Africa	St. Louis-Kankan-Parakou-Ngaoundéré-Bangui	4,400
West African Coastline	Dakar-Freetown-Abidjan-Lagos-Douala	3,800
Trans-Central Africa	Yaoundé-Bangui-Pakwach	2,400
Trans-East Africa	Adis Abeba-Nairobi-Quelimane	3,600
Pacific Line	Mombasa-Dar es Salaam-Beira-Maputo	3,000

Source: Fusion Energy Foundation, *The Industrialization of Africa*, Wiesbaden: Campaigner Publications, 1980.

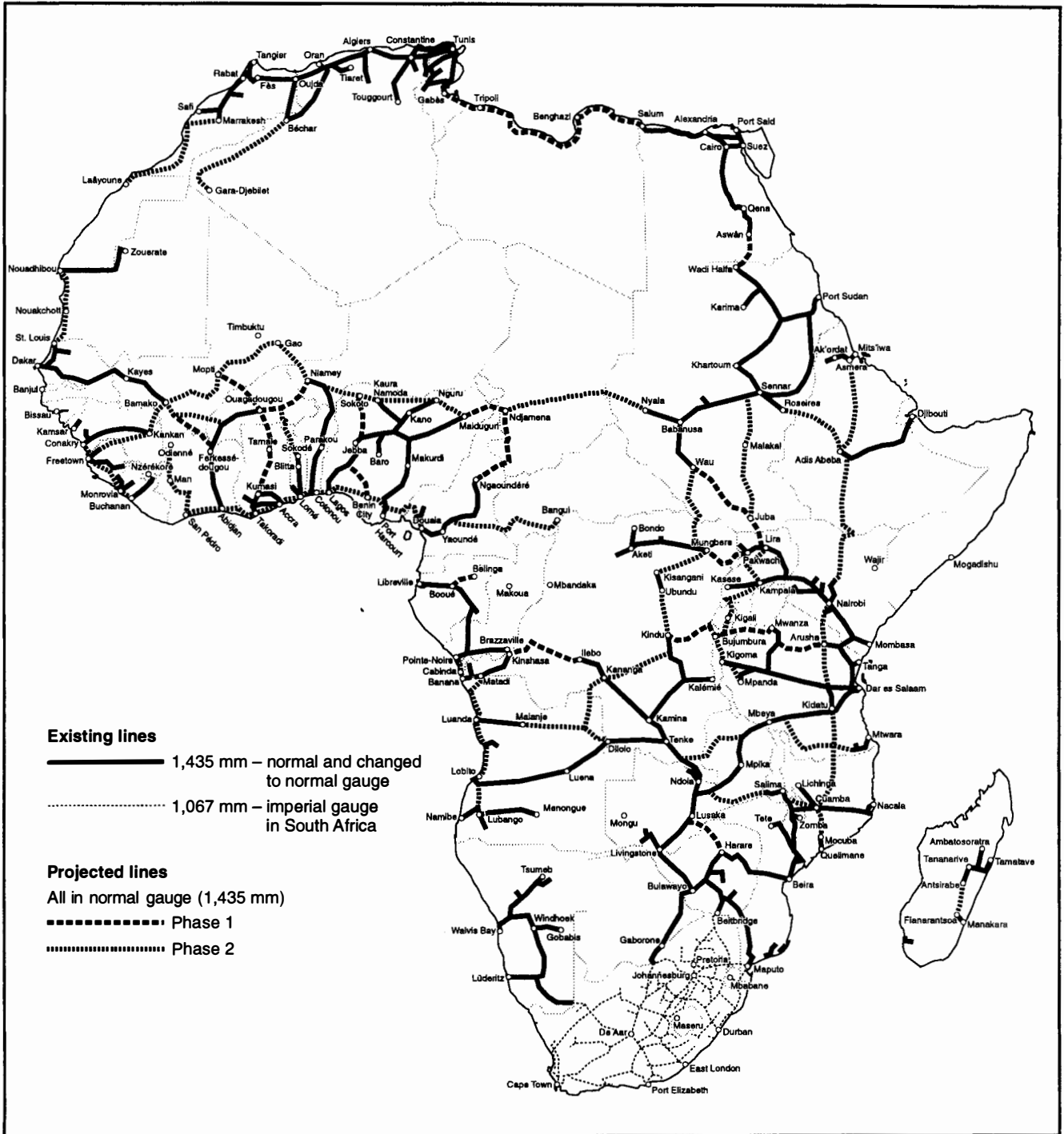
The railway network will remain only piece-work unless an obligatory standard gauge is agreed upon. The majority of African countries tend to favor the narrow "Imperial Gauge" as the standard, first of all because 60% of the existing track is of this width (construction of narrow gauges is cheaper than the broader ones). This may appear reasonable on the basis of short-term considerations, but over the long term—especially with respect to an industrialized Africa—it is a very bad decision. We propose the normal gauge of 1,435 mm as the standard for all of Africa, for the following reasons:

1. Construction costs for the narrow-width track can be 33-66% cheaper than the normal gauge, but the higher investment costs for the normal gauge will pay off better in the future; the normal width permits higher velocities, higher axle-loads, and therefore higher transport utilization than the narrow gauge. This may not be an important consideration at the present volume of African transport, but the railways of developed Africa will have capacities several times greater than this present volume.

2. Africa's railway system should be seen in connection with neighboring regions (Europe and the Middle East), where the railways are nearly all normal-gauge. With increasing development, direct railway connections between Africa, Europe, and Asia will be constructed. A standard gauge will be an important prerequisite.

3. Africa's future railway network will be over 500,000 km in length. Compared to that, the present track, amounting to 45,000 km (without South Africa), which has to be converted to the normal gauge, is downright meager, even disregarding the basic repairs needed on most of the track

FIGURE 2
Projected railway network, phase 1 and 2 (main lines)



Sources: Fusion Energy Foundation, *The Industrialization of Africa*, Wiesbaden: Campaigner Publications, 1980; *The Times Atlas of the World*, New York: Times Books, 1990.

stretches.

African governments like that of Gabon, which is constructing the new Trans-Gabon Railway with normal-width track, or the government of Nigeria, which plans to totally convert the country's narrow gauge to normal, are exemplary for their foresight.

Assuming a population of 462 million living in nuplexes at the end of the 20-year period, and taking European transport-density standards of 700 km railway network per 1 million inhabitants as a comparative base (see Table 1), we calculate an African network length of 320,000 km for the year 2000. Taking into account two-lane track for the main lines of the network, and more than that in the nuplexes, we get 650,000 km of track length. This network density, 11 km per 1,000 km² or 400 km per 1 million inhabitants, is still considerably less than the prevailing density in industrial nations. Nevertheless, presuming industrial centralization as foreseen for the nuplex concept, it will be both adequate and attainable: An estimated transport-volume of 6.5-7 billion tons per year corresponds to a utilization of about 5 million ton-kilometers per kilometer of track, and can, given a certain degree of efficiency, be multiplied.

Railway construction will have two points of emphasis:

1. Creating a dense network of the nuplex-centers, where the railway will carry the largest proportion of the transport tonnage. Construction of a total of 250,000-300,000 track-kilometers will be necessary in these centers alone. A network just as dense, if not quite as compact, will be necessary in densely populated regions such as West Africa and in the North African coastal region.

2. Construction of an interconnected continental rail network: Regions far from the coasts and landlocked countries will obtain effective connections to the ports, and thus to the world markets; international lines will connect individual national networks to each other, and will thus form the *backbone of the economic and political unity of Africa*. **Table 3** shows the main new international lines to be constructed; these will equip Africa with continuous north-south and east-west connections, and will thus connect the continent with Europe and Asia. A *Gibraltar tunnel* will allow rail transport from western Europe to Cape Town, and connections with the Arab region will exist via Egypt to the East European and Asian regions [see *EIR*, July 26, 1991, p. 36].

In the following, we will sketch the phases of construction of the African railway system. This is confined to a period of 20 years, the period in which the nuplexes will be built. The major construction will begin in the third phase in the 10th year. About 50% of the planned construction will occur in the fourth phase. The reason for this is the development process of the industrial nuplexes: Their export capabilities will become significant only after the 15th year, resulting in steadily increasing railway transportation; additionally, after the 15th year, the construction of the

nuplexes will have proceeded far enough to enable a significant share of the materials required for railway construction to be drawn from the nuplexes' own production.

Four-phased construction approach

Construction activity in the *first phase* will emphasize two points:

1. Conversion of available narrow-gauge track to the normal gauge. An initial exception will be South Africa, because the track here is in good condition. Since all track concerned is single-lane, conversion will mean new construction parallel to the old line, a process which will permit continued use of the old track and, in many countries, will make repairs of the old track superfluous.

2. Construction of new lines, especially to the landlocked countries and those regions at longer distances from the harbors, which will be sites for agricultural nuplexes. The projects included can be seen in **Figure 2**.

First-phase construction will amount to 56,000 km.

In the *second phase*, parts of the network will be laid in two lanes. This applies, firstly, to densely populated regions with certain development advantages, such as Nigeria and North Africa. The double-lane track will be extended to connect important harbors with extensive inland regions:

West Africa: Senegal-Mali (Dakar-Kayes); Ivory Coast (Abidjan-Ferkessédougou); Cameroon (Douala-Yaoundé).

Central Africa: Zaire (Banana-Kinshasa).

East Africa: Sudan (Port Sudan-Khartoum); Kenya-Uganda (Mombasa-Kampala); Ethiopia (Djibouti-Adis Abeba); Tanzania (Dar es Salaam-Mbeya); Mozambique-Zambia (Beira-Lusaka); Mozambique-Zimbabwe (Maputo-Harare).

Newly constructed stretches will have the function of:

1. Developing further access to areas of agro-nuplexes and connecting them with surrounding regions. This includes the following projects:

West Africa: Mali (Bamako-Mopti-Gao); Mali-Niger (Gao-Niamey); Togo-Upper Volta (Blitta-Niamey); Ivory Coast (San Pédro-Odienné); Cameroon-Central African Republic (Yaoundé-Bangui); "Transsahelian" (Bamako-Nyala).

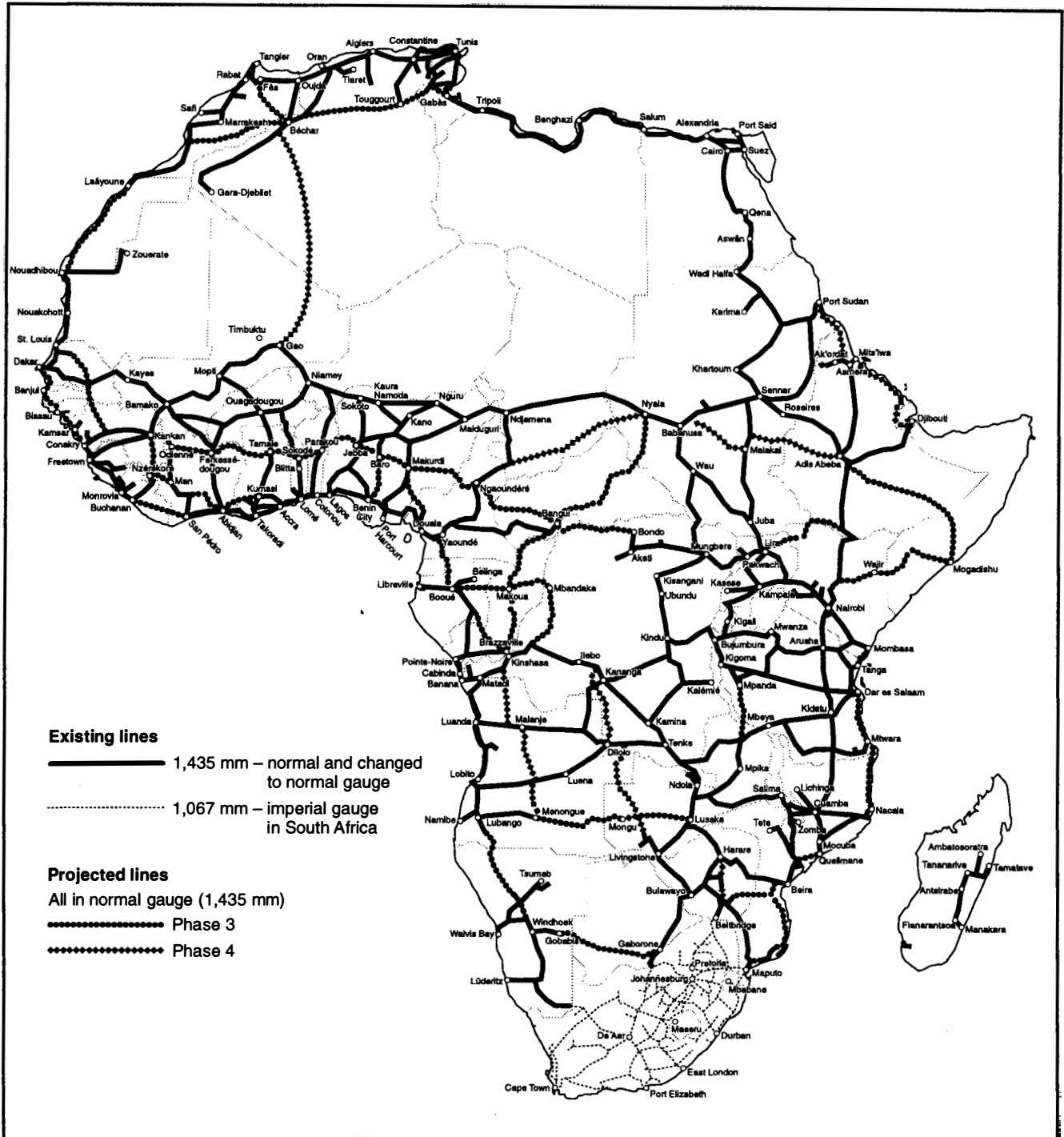
Central Africa: Sudan-Zaire (Wau-Kindu); Angola-Zaire (Malanje-Kananga); Angola (Malanje-Dilolo).

East Africa: Sudan (Sennar-Juba); Uganda-Rwanda-Tanzania (Lira-Kigali-Mpanda); Sudan-Ethiopia (Roseires-Adis Abeba); Ethiopia (Asmera-Adis Abeba); "Trans-East African" (Nairobi-Quelimane).

2. Some lines will open additional ports for inland regions, such as the Freetown (Liberia), Kankan (Guinea) line to Bamako (Mali) in West Africa, and, in East Africa, the connection of Tenke (Zaire) and the port of Mtwara in Tanzania, to be developed. Zambia-Malawi will be connected to Nacala with the Cuamba-Salima-Ndola line.

3. The remaining large projects of this period will aim

FIGURE 3
Projected railway network, phase 3 and 4 (main lines)



Sources: Fusion Energy Foundation, *The Industrialization of Africa*, Wiesbaden: Campaigner Publications, 1980; *The Times Atlas of the World*, New York: Times Books, 1990.

TABLE 4

The African railway building program

Year	Initial capacities		Construction in 5-year period (km)	Costs (billions \$)	Steel (millions \$)	Wood (million m ³)	Concrete (million tons)	Construction labor force
	Network length (km)	Track length (km)						
0	13,000							
5	69,000	69,000	56,000	56	6.7	10.1	50.1	840,000
10	112,000	130,000	61,000	61	7.3	11.0	55.5	910,000
15	185,000	300,000	170,000	170	20.4	30.6	154.7	3,360,000
20	320,000	650,000	350,000	350	42.0	63.0	318.7	6,300,000
Totals			637,000	637	76.4	114.7	579.0	

Source: Fusion Energy Foundation, *The Industrialization of Africa*, Wiesbaden: Campaigner Publications, 1980.

TABLE 5

Projected rolling stock and staff for African railway system

Year	Length of track laid (km)	Locomotives	Coaches	Wagons	Costs (billions \$)	Steel (million tons)	Staff
5	56,000	4,800	17,000	250,000	21.2	7.3	280,000
10	61,000	5,200	18,000	270,000	23.1	7.9	300,000
15	170,000	14,500	51,000	770,000	64.3	22.1	850,000
20	350,000	29,500	104,000	1,580,000	132.3	44.7	1,600,000
Totals	637,000	54,000	190,000	2,870,000	240.9	82.0	3,030,000

Source: Fusion Energy Foundation, *The Industrialization of Africa*, Wiesbaden: Campaigner Publications, 1980.

at providing industrial nuplexes with trans-regional railway connections. This means the partial construction of the *West Africa Coast Line*, the construction of the *Atlantic Line* from Matadi to Lubango, construction of the already projected railway from Marrakesh to Laâyoune, and the connection Nouadhibou-St. Louis.

Construction volume in the second phase will amount to a total of 61,000 km.

In the *third phase*, construction activity will be massively expanded. This will be due to the increase in exports from agro-nuplexes, and also exports from the industrial nuplexes, which will increase rapidly from the 15th year, so that a connected, even if somewhat loosely meshed African railway network must exist. During this phase, materials needed for railway construction will increasingly be derived from internal production, reducing import dependency; concrete, reinforced concrete, and, partially, the rails themselves will be produced in Africa.

The first aspect to be emphasized will be construction of about 50% of the international network, consisting of two-lane track; additional construction of international lines will

result in a track network approximately as indicated in **Figure 3**.

The main emphasis in construction activity, however, will be in the nuplexes. In the 15th year, the agro-nuplexes should have about 700 track-kilometers at their disposal, including the accessible main lines. Production facilities in the industrial nuplexes will be provided with a dense network of track connections and links to the main lines, and construction sites for satellite cities will be connected by rail. This signifies construction of about 1,000 track-kilometers for each industrial nuplex. The total volume of construction is then as follows:

Double-track construction:	45,000 track-kilometers
New track construction:	25,000 track-kilometers
Rails in the nuplexes:	100,000 track-kilometers
Total:	170,000 track-kilometers

The railway construction program in the *fourth phase* will create a rail network for the developed regions which measures up to European standards, i.e., construction of 350,000 track-kilometers to achieve a total network of

TABLE 6

Rolling stock density in Europe and Africa in 1980

(number of units per kilometer of track)

Type	Europe	Africa
Locomotives	0.085	0.078
Wagons	4.5	0.9
Coaches	0.3	0.1
Staff	5.0	4.3

Source: Fusion Energy Foundation, *The Industrialization of Africa*, Wiesbaden: Campaigner Publications, 1980.

320,000 km and a track length of about 650,000 km. This phase cannot be sketched here in much detail, because construction will concentrate primarily upon increasing the density of the national systems and developing a rail network in the nuplex areas. The trans-regional network will also be expanded. Figure 3 illustrates the entirety.

The end of the fourth phase by no means signifies the end of railway construction in Africa. The network of 320,000 km is calculated only for the nuplex regions and their population; the development of the population lying outside of the nuplexes and the expansion of available and construction of new industrial and agricultural nuplexes in the following years will be accompanied by a doubling of railway network capacities.

Costs of the program

In the following, we will provide a first approximation of construction costs, and material and labor force requirements in two tables. The calculations are based upon the following parameters:

1. A construction cost of \$1 million per 1 km of track is assumed (in 1978 prices). This value is far below the European average, but higher than the present costs of African railway construction of \$0.5-1.0 million. This higher assumed average is appropriate because increasing economic development will also bring increasing labor costs. These construction cost figures are for total costs; they include the first wagon parks, buildings, temporary infrastructure, etc.

2. Material calculations are based on the following values:

120 tons steel per km of track, 60 kg rails;

180 m³ wood per km using wooden sleepers (1,600 sleepers/km track);

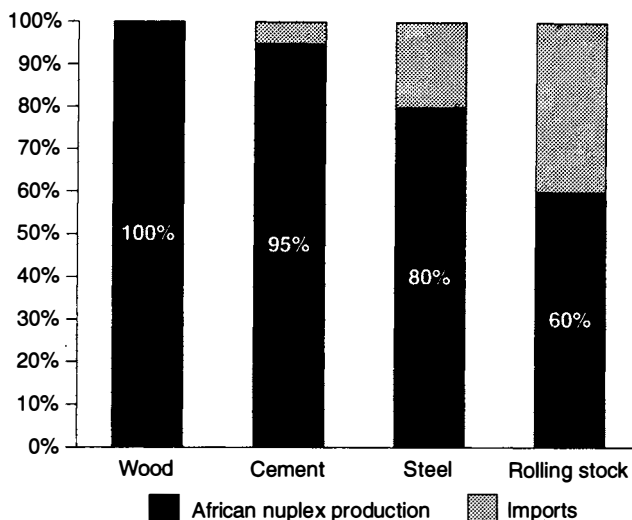
400 m³ (910 tons) concrete per km track for bridges, tunnels, etc.

The value for concrete requirements should only be taken as a rough parameter, because it can vary greatly according

FIGURE 4

Most material requirements for railroads could be provided by African nuplexes

(percent of total requirements)



Source: Fusion Energy Foundation, *The Industrialization of Africa*, Wiesbaden: Campaigner Publications, 1980.

to local conditions.

3. Labor power requirements are taken as 70 man-years/km. This includes all activities involved in construction of a stretch of track, temporary infrastructure, auxiliary construction, etc. Seventy man-years is calculated on the basis of capital-intensive methods, whereas labor-intensive methods, such as those used by the Chinese in building the *Tanzam*, would result in a calculation of 200 man-years. The skills-structure is as follows: 5% highly skilled, 35% skilled, 65% basic-trained and auxiliary manpower. The values in **Table 4** always give the labor force requirement of the last year of the respective five-year period. **Table 5** shows required rolling stock, corresponding costs, steel and personnel requirements. The parameters for calculation are taken from European railway statistics. For comparison, **Table 6** provides present average values for Africa.

If we consider this construction program in connection with the development of the industrial nuplexes, it turns out that the largest part of materials required can be covered by domestic production. Cement for concrete will be available in the very first years, and deliveries of steel for rails and vehicles can be expected from the tenth year onwards; production of transport and personnel vehicles, and later even locomotives, can begin in the third phase.

Figure 4 illustrates the extent to which materials requirements can be met by domestic production.

Without water, there is no life: a program to make the deserts bloom

by Jonathan Tennenbaum

This article appeared in EIR, Sept. 28, 1990; it has been slightly abridged:

Without water there is no life. He who can bring fresh water to the deserts, wields a power greater than any force of arms, a life-giving power which alone can bring stable peace to Africa.

Contrary to the conceptions of British "economics," fresh water is not a limited resource. Based on the expansion of human productive powers, through science and technology, we can generate as much fresh water as human needs will ever require—anywhere on this planet, at any level of population, and at any time in the future. The same is true of every other commodity needed to sustain and enrich human life. The doctrine of "limited resources" is a lie, propagated by imperialists who seek to control nations and populations by imposing artificial scarcity.

We call for combining a series of already proposed water-management projects with the large-scale use of nuclear power to desalinate water, to establish a system of reservoirs and man-made freshwater canals and rivers throughout the Middle East-North Africa region. By this means, we can meet all foreseeable water needs and provide the foundation for economic development and peace into the next century.

Nuclear energy and desalination

Consider what we can do with nuclear energy. Take an extreme case: an agro-industrial colony in the middle of a desert, in a location not easily reachable from freshwater-management projects now on the drawing boards. We take half a dozen high temperature reactor (HTR) modules of a type which today can be produced on an assembly line. We put these modules into a power plant producing 1-2 gigawatts of electric generating power and an additional 1-2 gigawatts of usable heat output. We apply a portion of that electric and thermal output to desalinate sea water, using a combination of existing processes, to the rate of 70-100 cubic meters per second. This provides ample fresh water for the domestic, irrigation, and industrial needs of a self-sustaining agro-industrial colony of 1 million people. The rest of the HTR power we use for pumping between the sea and the location of our colony (at an elevation of, let us say, 400 meters). A few more nuclear units cover the electricity and process-heat

requirements of the colony itself.

Two dozen such HTR-desalination centers produce a flow of fresh water equivalent to that of the Nile and Euphrates combined—a man-made river system.

In practice, the actual size of desalination complexes can vary over a wide range, using recently perfected modular nuclear reactor designs. Complete desalination units, including nuclear power sources, can be built in assembly-line fashion on floating platforms for rapid transport and installation. The technology and most of the development work for such mass-produced units are already complete. The HTR modules possess stability and inherent safety characteristics which make them ideally suited for large-scale use throughout the region.

This application of nuclear power illustrates what can be done more generally, with the quality of productive power which nuclear technology embodies. Apart from the unlimited potential of desalination, it is eminently possible to transfer huge quantities of fresh water from areas with a surplus of such water—above all the tropical rain regions of Central Africa—into the Sahel, North Africa, and the Middle East. Projects to accomplish this, through systems of canals, reservoirs, and pumping stations, have long been on the drawing boards. Included are projects for channeling water from the Congo River system (Ubangi) to expand Lake Chad, and for generating a "second Nile" by further developing the source regions of the "White Nile." To this is added a smaller, but significant and expandable fresh water potential which could be pumped from Turkey to its southern neighbors, as proposed by the Turkish government in its "Peace Pipeline" plan. Through these and related projects, significant improvements in the water supply of the Middle East and North Africa could be realized within a few years, with dramatic improvements by the year 2000.

It is crucial that the water flows thus generated not be dispersed in an arbitrary manner, but be organized and concentrated in a network of man-made rivers and lakes.

Water from the Mediterranean, Red Sea, Persian Gulf, and Arabian Sea can be channeled via canals into a series of artificial reservoirs. The variants of the Qattara Depression reservoir project in Egypt and the plan to refill the Dead Sea from the Mediterranean, are illustrative of some ways in which this can be accomplished. Where necessary, water



The Volta Dam at Akosombo in Ghana. Through science and technology, we can generate as much fresh water as human needs will ever require, anywhere on this planet.

must first be raised through pumping to points from which the water can then flow to reservoirs via canals. The power for this can be supplied by nuclear reactors. Where the creation of canals and reservoir basins requires large earth-moving operations, nuclear excavation can be employed with advantage. Canals provide both the water flow to fill the reservoirs, and also a transport means. Along the canals and reservoirs we can construct complexes of nuclear power and large desalination units, generating fresh water for a system of freshwater canals. Large-scale use of desalination is complemented by channeling and pumping of fresh water from natural sources.

Instead of simply spreading the fresh water around evenly in an irrigation system, we can create with these rivers a network of interconnected "green bands" of development. As opposed to mere isolated "green islands," these green bands become at the same time transportation axes for the movement of goods and persons by ship, rail, and road, and the locations for new towns, cities, and industrial complexes. In this way, the development of the Middle East and Africa will re-create the history of Europe, which is inseparably linked to the natural water infrastructure of the Rhine, Seine, Loire, Rhone, Danube, Elbe, Oder, Vistula, Po, and other great rivers.

The locations and courses of the new rivers and "green bands" must be determined by geographical, geological, and infrastructural considerations, bearing in mind the future growth of population and transport as well as the regime of

water flows which will arise through increase in natural rainfall.

The reservoirs of (salt) water channeled inland from the seas will serve to supply the desalination plants and various industries along their shores; provide a means of transport, together with the canals; and evaporation from these lakes enhances the water cycle of the atmosphere. The Qattara Depression and Dead Sea projects would have these benefits, in addition to their hydroelectric potential.

The ability to provide flows of fresh water gives us also the power to modify the climate of the region. Evaporation from lakes and reservoirs and transpiration from plants and the other effects deriving from large-scale, irrigated, intensive agriculture in desert areas, enhances the natural processes for generation of rain. Provided that water management and agriculture expand in parallel with the increase in rainfall, this process becomes self-accelerating. The throughput of water among the atmosphere, sea, land, and biomass grows to the point that the deserts finally disappear, and a mild, "Mediterranean" climate is established.

Link to the 'Productive Triangle' in Europe

The most essential precondition for the proposals outlined here, is the speedy realization of Lyndon LaRouche's infrastructure development program for the Paris-Berlin-Vienna "Productive Triangle." The fate of Africa and the Middle East is inseparably linked to generating a new "economic miracle" in Central Europe via high-speed rail and magnetic levitation systems and a renaissance of nuclear en-

ergy. Given the collapse of the U.S. economy, it is continental Europe, together with Japan, which must provide the decisive margin of technology for developing Africa. This includes the mass production of nuclear modules and desalination units over the next 15-20 years.

In this context, we must upgrade the transport infrastructure between North Africa, the Middle East, and the "Productive Triangle" in Europe. The LaRouche "Triangle" program provides for a series of infrastructure corridors known as "spiral arms," which link the core Paris-Berlin-Vienna region to the entirety of continental Europe and which include connections to the southern tip of Spain, a bridge to Sicily, high-speed rail connections to Istanbul, and connections to the Black Sea. These infrastructure corridors must now be extended to embrace North Africa and the Middle East.

The process outlined here can be usefully thought of as a "war against the desert," with the goal of eventually attaining "final and complete victory." Europe's Productive Triangle is the decisive ally in this war. To cement this alliance, we must clarify that the common interest lies in the securing of long-term peace and the generation of real wealth for the present and future generations. This requires a common understanding of what constitutes real wealth, as opposed to fraudulent (British) notions.

There is no wealth apart from the power to maintain human life. In the war against the desert, we must maintain and extend human life in a hostile environment, just as man one day in the future will conquer Mars and other planets. It is the power to do that which constitutes, in first approximation, real wealth.

Wealth resides in the power to advance the productive powers of labor, as measured by the relative potential population density of a society: the maximum density of population which could sustain itself, by the forms of economic activity prevailing in that society, per square kilometer of any given quality of land.

It is growth of productive powers—to *produce* what human beings require to live and work *productively*—that constitutes real wealth, not "natural resources" in and of themselves. This is proven by the huge population density in Japan and Western Europe, which are poor in natural resources compared to many other regions of the world, but have achieved high rates of progress.

Oil, for example, has no intrinsic value in and of itself. It is useless without the technologies which extract, refine, and consume that oil. Only through technology does oil become useful for the maintenance of human life. And the progress of technology will one day make exploitation of oil obsolete.

Water would seem to be immediately valuable, for life is impossible without it. But, is it the immediate possession of some quantity of water now which constitutes wealth, or the power to *generate* sources of water in any quantity into the future? If we have water to drink today, but are going to thirst tomorrow, is that wealth?

The question of cost

The following discussion is excerpted from an article by Jonathan Tennenbaum, "Reflections on the Cost of Water and Mideast Peace," in EIR, Oct. 12, 1990:

The provision of freshwater supplies is limited only by the development of productive power, through technology. Often however, this fact is obscured by misplaced emphasis on apparent monetary cost. There are two points to be made in this connection. The economic costs of water supplies are determined by two major factors: 1) the natural environment of the region (climate, geology, hydrology, ecology, etc.); 2) development of the productive powers of labor, as reflected in technology.

It is obvious that to provide a given flow of fresh water per square kilometer of a desert area, requires a relatively greater effort (other things being equal) than to provide the same flow density in an area with abundant rainfall or in the vicinity of a great river. This circumstance is reflected in the widely varying supply costs of fresh water in different areas of the United States, for example.

Apart from differences in natural environment, the cost of water is a function of the level of technology. Employing the full potentials of nuclear and other advanced technologies, the nations of North Africa and the Middle East might provide fresh water to their arid regions at a lower overall social cost, than the inhabitants of Central Europe expended for their water requirements three generations ago. We have only to compare the present projected costs of delivering nuclear-desalinated water to Middle Eastern deserts with effective cost (expressed in labor time) of freshwater supplies in Central Europe today and 75 years ago. The key to the matter is the dramatic increase in labor productivity over that period. That is the first point.

This being said, we must still assume a significantly higher cost of water than would prevail in less dry areas of the world *where the same technological level were employed*. So, the cost of nuclear-desalinated water pumped from sea level into the Arabian Desert, for example, would be about twice the present cost of municipal water supplied to the city of Munich. Given that nearly the entire water consumption for agriculture in Germany is provided "free" from rainfall, this high cost of water translates into a higher cost for domestically produced food, a higher cost of maintaining labor at any given living standard, and a higher relative cost for nearly every branch of production. This is particularly the case in an early phase of economic development, and raises an important point of economic policy.

Should we then conclude, as economists of British "free market" persuasion do, that there is no point in developing agriculture and industry (apart from extraction and refining

of oil) in the region, since these could not be competitive on the world market? . . .

Friedrich List's answer in the 19th century, which Lyndon LaRouche has sharpened in crucial respects more recently, is essentially this: The goal and measure of economic activity is not to acquire various commodities at the lowest possible cost, nor to gain the largest margin of monetary profit. Rather, the purpose is to accomplish the *highest rate of growth in the productive powers of labor*. Wealth resides exclusively in the expansion of those powers.

So, by concentrating its efforts on developing science and technology, and a higher level of education of its labor force, Germany became the most powerful industrial nation in the world. Crucial to this was List's dual tactic of protective tariffs and development of infrastructure. The tariff system of the German Customs Union, or *Deutsche Zollverein*, ensured that none of a broad array of industrial commodities could be imported and sold at less than the cost of production of those same commodities in Germany, plus a certain margin which the fledgling German industry required for investment into technological improvements. The relative price level maintained in this way is known as a "parity price." (There are other means to achieve the same effect of parity, but the principle involved is always the same.)

Naturally, at first this meant paying a much higher price for various commodities than the "world market price" as determined, essentially, by the City of London. Within a short time, however, the construction of railroads and other infrastructure, together with development of technology, boosted the productivity of German industry to the point that the costs of production became generally much less than those in Britain—despite the British Empire's vast exploitation of slave labor and looting of raw materials!

The same principles apply to developing the labor power of the Middle East and North Africa today. That is the second point. Were the equivalent of "parity prices" to be introduced in systematic fashion for a variety of agricultural and industrial products, combined with crash programs of water and other infrastructure development, we would see an unprecedented boom in the internal economies of the region—despite the relatively high apparent costs of water.

This brings up a deeper point concerning "cost."

We must consider, both on the local level of individual regions and nations, as well as on the level of the human race as a whole, how we can achieve the highest rate of development of the productive powers of labor. For, ultimately, in real economic terms, "cost" has only the significance of the difference in rate of development of the powers of labor resulting from alternative courses of policy. We "pay" for a wrong policy in a deficit of that development which would have occurred had we followed a more correct policy. Whereas, properly considered, we do not "pay" for a correct policy at all, but only gain from it.

The restoration of the Lake Chad basin

by Yves Messer

The following was adapted from a 1990 Schiller Institute study in France on "The Role of Europe in Promoting an African Renaissance":

Geography: Lake Chad is in a strategic position for Africa as a whole, situated at the crossroads of the largest axes between west and east (from Dakar to Djibouti) and from north to south (Tunis to the Cape of Good Hope). Bordered by Chad, Niger, Nigeria, and Cameroon, the basin is surrounded by a mountainous massif or by plateaus that open out toward various directions: in the north toward Libya, in the east toward Sudan, in the south toward the Central African Republic, in the west toward Niger.

History: Lake Chad, and in a larger sense the pan of the Chadian basin, has often played the role of historical crossroads for civilizations, for trade of goods, merchandise, and ideas. According to Kotto Essomé and other historians, it was around Lake Chad that the Bantu civilization split up in its progression toward the south and east.

Geology: The Chadian basin is the result of the collapse of the Pre-Cambrian crystal shield, probably during the Ice Ages. A part of the glacier would have been trapped giving rise to an inland sea. Four different incursions over the last 50,000 years have produced different sediment beds which make up the natural soil richness of the Chadian basin.

Climate: The dry climate we are familiar with today is far from what this region always had; during the last Ice Age, that is, from about 32,000-20,000 years before the present (BP) up to 14,500 BP, major pine forests accompanied by grasslands were dominant all over the Sahara. Since this period, up to about A.D. 200, we see an alternating succession of dry and wet periods, both over the Sahara and the Chadian basin. After this date, the two climates came into phase toward a dry climate.

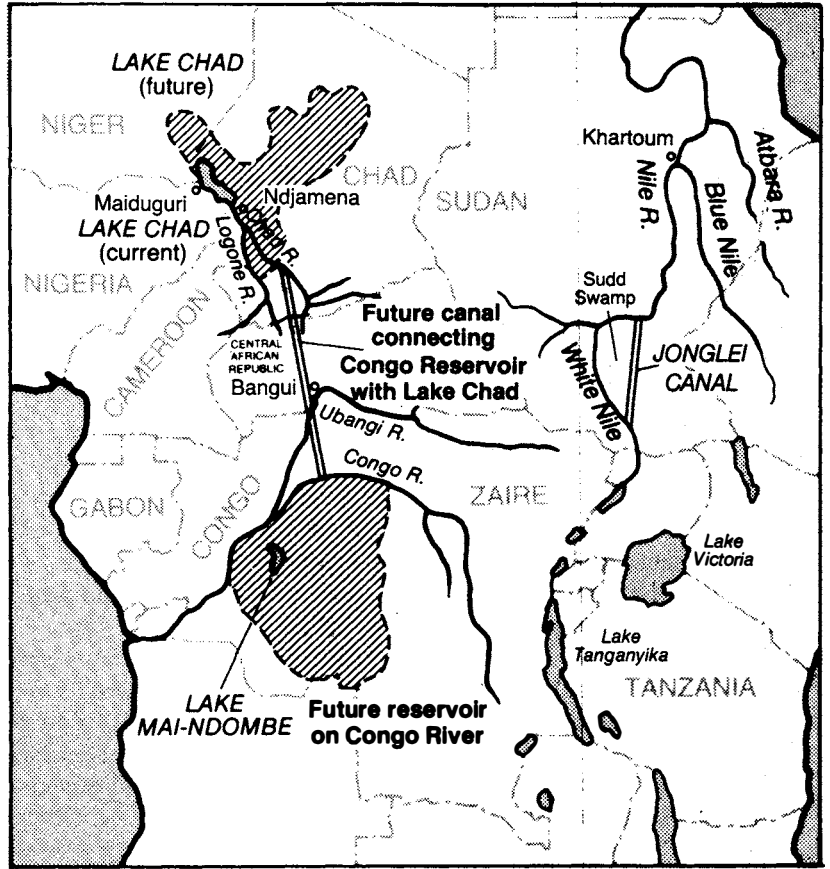
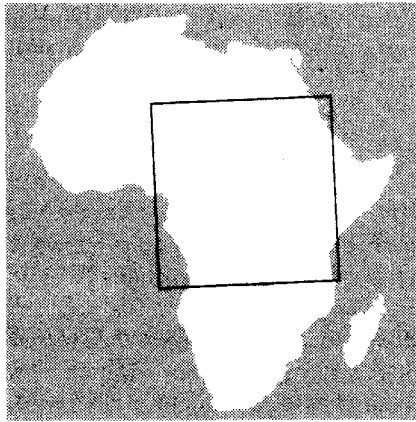
Lake Chad is at an advantageous location from the climatic standpoint, at the inter-tropical front between the dry air masses from the Sahara and the tropical air masses. This singularity allows Lake Chad to directly act as a lever to change the continental climate.

The present situation

The lake has lost over 90% of its surface area, of open water, going from 22,000 km² before 1970 to less than 2,000 km² only 15 years later. This loss corresponds to 15 years of

FIGURE 1

Lake Chad-Congo Basin, and Jonglei Canal projects



continual drought, most recently over 1984-85; the annual deficit of the Chari-Logone network alone decreased 60% between these two periods, and 85% for 1984-85. Economically, the results have been dramatic: loss of exploitable land areas, inability to graze herds, soil erosion, and famine.

1) **Saving populations:** Urgent measures must be taken to provide immediate food and sanitation.

2) **Revitalize the lake:** It is necessary to restore its 22,000 km² (with a depth of 283 m and an estimated volume of 80 billion m³). A study of river supply (essentially the Chari and Logone) and rainfall (the latter representing one-sixth of the total supply) shows that a critical threshold is reached at a supply of about 50 billion m³ per year, assuming an average flow of 1,580 m³/second. Above this flow, the volume of the lake grows; below that, it shrinks, even with a slight rise in inflow from one year to the next, if this rise remains below the critical 50 billion m³ level. With these last measures reaching an average annual supply for the Chari-Logone of 530 m³/sec. (compared with an average of 1,380 m³/sec. for 1955-69!), and figuring the supply from rainfall as practically nil, the lake must be fed with an average annual flow of roughly 1,000 m³/s; which comes out to (in the worst years) only one-third of the supply from the Ubangi River.

The latter is not the sole source of supply; a part could still be levied directly from the Zaire River toward the Ubangi; the

seawater could be desalinated and fed into the Bénoué, a tributary of the Niger, while diverting the direction of the flow toward the Logone. An array of pumping conduits over the 200 km that separate the Chari-Logone and Zaire basins will allow the supply of the Ubangi to be multiplied in order to feed the Chadian basin. By making use of the natural infrastructure afforded by one or more tributary river beds to the Chari, it should be possible to reestablish the water levels at 283-284 meters within several years. This presumes the creation of one (or several) weirs upstream from the town of Bangui, Central African Republic, and the creation of powered pumping units. These pumps should be supplied by nuclear energy.

In addition to annual regulation, by supplying subterranean water table that depends on the lake, we will need seasonal and daily regulations which include polderization of the lake to increase cultivable land and to prevent silting, and flood control of the Chari-Logone network, which has tremendous losses during the rainy season.

Pump-priming the water cycle

Through studies at the beginning of the century, the French engineer Hyppolite Dessoliers demonstrated how overcoming evaporation in certain areas could generate rain. He even elaborated a strategy for the rollback of the Sahara.

In this study, since ignored, he showed that the tops of the mountains, such as Tibesti, Ennedi, or Aïr, were the starting point for daily storms and precipitation. From his observations, accumulated in his work *Refoulement du Sahara (Rolling Back the Sahara)* published in 1930, he proposed a series of solutions to increase the rainfall over entire regions, which center around a climatic principle one could dub the “Dessoliers paradox,” which goes something like this: How can one force precipitation from a humid air mass? Either one can raise the relative humidity, or cool it down such that it reaches the temperature limit of saturation. But if the air mass is not humid enough, paradoxically, it must be heated. In effect, rain is a phase change; hence, the effect of work. By superheating a sufficiently humid air mass, thermal energy is transferred in the form of “latent heat.” This latent thermal energy produces the work of elevating this air mass, and hence its energy potential. If this energy potential is sufficiently great, the humid air mass will rise to the colder levels of the troposphere. By convection, but also by expansion (the principle of refrigeration), the air will cool off enough to attain the temperature limit of saturation, to precipitate in the form of rain drops. This precipitation also causes the release into the atmosphere of part of the accumulated latent heat in the form of water vapor. Dessoliers observed that the more humid and warm the air, the more it will “potentially” hold, and the higher and greater the cloud formations.

This is the principle behind climatic thermodynamics and therefore the water cycle.

Dessoliers conceived of the construction of coordination centers of superheated air (large solar reflector surfaces) fed by water vapor (by siting them near forests, lakes, and farmlands). The superheated air would draw in air that would be channeled toward the center by a conical metal structure, in order to create a localized cyclonic low pressure area.

Today, we could suggest using towers similar in form to those used in nuclear plants. Their hyperbolic form will be a necessary element to reach the required altitude with a minimum of starting energy (latent heat).

Adapted to the problem of Lake Chad, this principle will allow us to recover, bit by bit, by daily rains, part of the 50 billion m³ of water (some 2 m of depth) that are lost every year to the Saharan winds and seepage.

In order to develop a new water cycle, we must take the following measures:

- reforesting the mountain heights in order to humidify the natural air drafts in the plains;
- irrigation works;
- greenhouse agronomy, using a system of filtering all solar wavelengths except those absorbed through photosynthesis, permitting a temperature drop favorable to all growth.

Water projects on the drawing boards

by Marcia Merry

Africa is part of the world's greatest dry land region, due in part to unique geographical features. The vast expanse from east of the Atlas Mountains in North Africa, extending through Southwestern Asia to the Indian Desert, is an area without close exposure to ocean-related rainstorm patterns. However, rivers and lakes can be created as two important proposals for water development were described in EIR, Sept. 28, 1990:

The Jonglei Canal

In southeastern Sudan, where the upper White Nile River rises, before joining the Blue Nile and flowing on as the Nile River into Egypt, there are extensive marshy areas known as the Sudd swamp (see map, page 73). Construction of a channel from Jonglei, at the swamp, downwater to Malakal, and construction of a canal system, would regulate the swamps of southern Sudan, where large quantities of water are now lost by evaporation. Much of this water would be conserved, and the flow of the White Nile increased. Hundreds of thousands of acres of prime farmland would be created in the process in Sudan.

The project was started, then halted because of funding problems, and the obstructionism of the ecology movement, which has made preserving swamps and “wetlands” the excuse for stopping water improvement programs.

Groundwater development

In 1984, satellite overflights of the Mideast and North Africa, and use of the “Big Camera” infrared sensing (from Itek Optical Corp.), confirmed the location of significant bodies of underground water, whose existence was previously known only in part. The satellite data give only the location; the depth, quality, and size of the water deposits must be confirmed by on-site hydrological measurements.

Subsequent tests show quantities of underground water in the western Egyptian desert that could provide sweet water for 50 years of agriculture. One proposal is to undertake the construction of strings of oases, forming corridors of agriculture and settlement, and converting the sands of the desert into sod. The siting and archeological features of these water deposits indicate the existence of rivers flowing northward into the Mediterranean Sea from highlands in central Africa.

In the western Sahara there are at present extensive underground flows of water, whose direction and quantities could be programmed for use.

My 15-year war on pandemic disease

by Lyndon H. LaRouche, Jr.

This speech by Mr. LaRouche was delivered on his behalf to the World Conference on HIV-AIDS and Global Depopulation, held in Philadelphia on Nov. 28-30, 1989.

My name is Lyndon LaRouche and apart from my notability as a former candidate for the U.S. Democratic presidential nomination, I'm by profession a physical economist, that is, a specialist in the relationship between man's effective use of scientific and technological progress and increase of man's physical productivity in our relationship to nature, to the planet, and implicitly to the Solar System and to the universe at large.

My concern, like that of Leibniz, who is the founder of this branch of physical science, and of Hamilton, who was a follower of Leibniz in this respect, is to increase the standard of living and the level of culture and freedom of the individual through increase of the average productive powers of labor of society in energy-intensive, capital-intensive modes.

In the course of things, my encounter with what is called popularly "AIDS," or better, the HIV virus, or retrovirus, began implicitly in 1973-74, when I commissioned and outlined a study of the epidemiological effects globally of changes in monetary policy, which had been initiated during 1970-72 under Kissinger and Nixon. A study was conducted based on that outline, and the result published, which indicated that if the then present monetary and economic policies of the early 1970s were continued as a trend of policy-shaping, then we could expect that by the middle of the 1970s, the world would be gripped by a major epidemiological disaster or the onset of a major epidemiological disaster.

The study focused upon the signal role of an outbreak of cholera in the Sahel region of Africa during the first half to middle of the 1980s, as the key signal of the outbreak of this general epidemiological crisis globally.

In the context of that study, I emphasized, and was supported in this by the other professionals working to prepare the study, that these were precisely the conditions for the emergence, not only of *old* types of pandemics and epidemics, such as cholera, typhus, bubonic plague, and so forth; but these were the conditions in which new types of viral pandemics and epidemics might explode. For instance, we considered at that time such things as Lassa fever, which was confined then to a certain part of Africa, but might under

these conditions become globally pandemic or epidemic in some variety, or something of that sort. So we were looking from that time onward for the danger of a new type of viral, global pandemic or pandemics, breaking out if these epidemiological conditions persisted, and if the economic conditions producing these epidemiological potentials were to persist, that is, the present drift in monetary and economic and financial policies.

In the course of time, by the early 1980s, especially by 1983, it became apparent to us that there was a connection between what was then called AIDS, or HLTV, and those we had studied, that perhaps this was the kind of viral disease, pandemic or potential pandemic, which we had feared might erupt when we projected our study back in 1983 and published it in the course of 1984.

In the course of events, I had the occasion to bring together a group of scientists during 1985, scientists representing the medical profession, biologists, especially biologists from the field of nonlinear spectroscopy, nuclear physicists, plasma physicists and so forth, and we took a look at these problems, this disease so-called, this infection, with the idea of determining what might be the nature of the problem, what might be the measures that we should take, to deal with the disease, with the infection.

So, we came up, as a result of this, with a three-point program, which emphasized that this was a new type of disease, which the medical profession had never encountered in its clinical practice heretofore, a so-called lentivirus, retrovirus, which veterinarians knew in the animal kingdom, but the medical profession dealing with human patients had not experienced clinically previously, and therefore did not realize what they were up against; whereas, biologists would tend to understand more quickly, the potential of such a lentivirus.

Secondly, that the ordinary methods of treatment and cure would probably not work; that molecular biology would play a useful but limited role in dealing with the effects of this infection, but would not be an adequate answer; that a new approach, including resort to the technology of nonlinear spectroscopy, would be required, to find not only a means of controlling the disease, and attempting to prevent it, but also ultimately of curing people infected with it—that is, the hope of eliminating the virus from their system, or eliminating it as a potential factor in their health and as a communicable disease in their system.

A three-point crash program developed

So we came up with a three-point program, in which I recommended that \$3 billion be allocated to fundamental research to develop not only pharmaceuticals—AZT now in use was an example of the kind of thing we had in mind—but also to develop a fundamental cure. We specified that we were thinking of a crash program, like the Apollo Program for space, with a target of five years to discover a basic,

feasible approach to a cure, as well as producing amelioratives, such as AZT, to try to contain and slow the disease within persons who are infected.

The second point we emphasized was that we needed a program of nationwide testing for the virus, and we needed an outpatient program of treatment of those who were discovered to be infected. More and more people today are now coming to that view. This was a view expressed by some recently at the Catholic conference on the subject of this disease at Rome, at which it was emphasized that with new devices, new chemicals, it is more and more important to make these things available to people in the early stages, before they become symptomatic, and while they're infected in the early stages, to try to prevent them from reaching the terminal phase of the symptoms, to slow it down, to prolong life.

The third part of our program was to emphasize that indications were that people who did become terminally ill with the infection, the hospitalization costs would reach between \$150,000 per year and up, based on some sample indications from the military and other studies of the cost of care.

It showed us, this investigation, that the costs would be enormous, that with the percentage of the population infected and the likely rate of spread of the infection, that during the course of the 1990s, this disease might approach the order of magnitude of the national defense budget. For particularly the \$3 billion a year not being so great an amount for basic research, but the amount required for mass testing and clinical outpatient care, as well as for in-hospital care, for constructing the hospitals adequate for this kind of disease, would amount to very large amounts of money, which we would have to come up with somewhere.

The alternative, of course, is to put people into hospices when they become ill; hospice is another word for charnel house, or death camp is another kind word for it, where the rate at which people die is accelerated by sharing the various kinds of infection each of them has with the others, all of whom of course, because of their condition, are very susceptible to all kinds of infections, whereas healthier people would be more resistant.

That is the status of things. The question before us is twofold still: 1) the question is the means, the scientific, medical, and related means required to address the problem; 2) equally important, the will and the caring for our fellow human beings, to muster the scientific and medical effort at whatever cost, to meet the problem.

Finally, one point: At the time, in 1985, when we first conducted the study, there were indications to us that this was not a disease which had developed spontaneously. It had not moved spontaneously from the animal kingdom to the human populations. There were no traces, no spoor, no track, none of the things that should be there in evidence, if such a migration had occurred.

Is AIDS the 'Satan bug'?

The likelihood was, in the best opinion of the best experts, that this had been created accidentally. It would have been possible, we thought, for somebody to have created it deliberately, but this being a Satan bug—that is, everybody dies of it, no known cure—we didn't think anybody on this planet with a capability of creating such a disease would have created such a Satan bug deliberately. Maybe we were wrong, but our best estimate, and my personal best estimate to this day, is that this was created accidentally.

In 1973-74, LaRouche commissioned a study of the epidemiological effects of changes in monetary policy, which had been initiated during 1970-72 under Kissinger and Nixon. The study showed that if those policies were continued, then we could expect that by the middle of the 1970s, the world would be gripped by an epidemiological disaster.

We know the capability of doing this was generally known to people from the 1950s on. It could have happened anywhere from the 1950s on. Signs of the eruption of the infection coincide with that, the 1950s and early 1960s. That all fits. And there have been several suggested ways in which this accident might have occurred, all of them all too plausible.

It would be very useful for us to know exactly how it was developed, by what kind of accident it was developed, because this might give us keys as to how to address the problem more efficiently.

But even disregarding that, we come to the other question. Suppose this were not created deliberately, as a means of reducing the population of people of unwanted skin colors or something of that sort; suppose it were just strictly an accident, which got out of control before people realized what had happened. The question is, what is our policy toward it today? Are we willing to allow the disease to take its course, at least to a limited degree, to the effect that the continent of Africa, at least black Africa, is decimated? Other parts of the world are decimated? Or do we consider *every* human life sacred, and are we willing to mobilize the resources, the scientific, medical, and other resources needed, whatever the cost, to save every life, whatever the color of skin, whatever the part of the planet that life represents?

South Africa can be a powerhouse for developing the whole region

by Roger Moore

The article excerpted here first appeared in EIR, March 9, 1990:

There is one overriding criterion for analyzing South Africa, its internal dilemma, and its relations with its neighbors: Can this economic powerhouse become the cornerstone for saving Africa? Africa is dying. The future of southern Africa depends on the further industrial development of something the world unfortunately knows little about, the Pretoria/Witwatersrand/Vereeniging region (PWV). Being the location of the major gold reefs, large coal reserves, and the minerals of the bushveld igneous complex, the area had a head start in the generating of wealth. But this is only secondary to the fact that the surplus from this wealth was reinvested into the creation of the biggest industrial economy on the African continent. It was the political battles of republican-oriented elements which ensured that the profits from the raw materials were rechanneled within the country for the creation of infrastructure, industrial jobs, and new wealth production.

From Zaire to Mozambique, the fate of black African nations depends on the unleashing of further wealth production in the industrial regions of South Africa, their natural ally in building and financing the essential infrastructure projects denied them by the International Monetary Fund (IMF) and World Bank. South Africa itself needs a new sense of nationhood, uniting all groups in the great task of bringing prosperity to sub-Saharan Africa.

Figure 1 shows how the South African economy dwarfs that of neighboring nations. The energy production figure is one of the most revealing. Throughout the postwar period, South Africa's Electricity Supply Commission (ESCOM) pursued a policy of rapidly expanding energy production as one of the key infrastructural prerequisites for the creation of an urbanized industrial work force. Electricity supplies are increasing at the rate of 6% per year. Throughout black Africa, though, the word from the IMF and World Bank, is that Africa should not engage in large capital projects. Per capita and per hectare energy consumption figures are disastrously below levels required for modern agricultural and industry sectors, thus condemning most of the population to "appro-

priate technology" subsistence agriculture.

The steel production figure reflects the commitment, since 1928, to pull South Africa's economy out of the grip of being a colonial dependency on the British Empire. In a manner similar to the Hamiltonian economic policy of the young United States, leading strata implemented their right to develop domestic manufactures. The 1928 founding of the state steel company, ISCOR, was the first phase. Tariffs and protectionism were used for a systematic policy of import substitution.

The tractor figure is a useful measure of energy and capital intensity in agriculture, of the move away from subsistence agriculture. In the land mass between the Sahara Desert and the borders of South Africa there were only 113,000 tractors as of 1982.

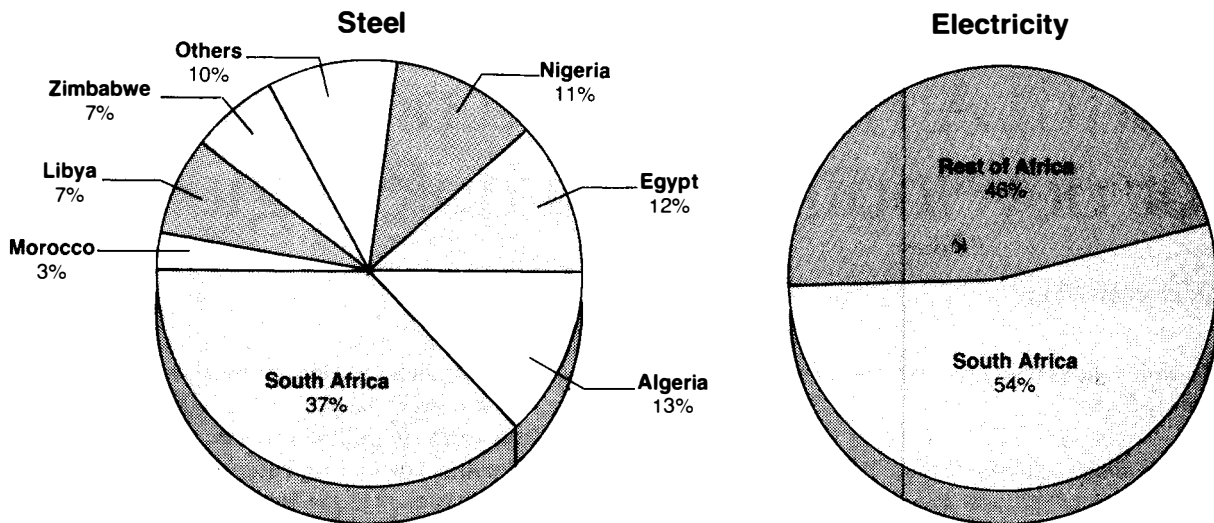
Agriculture: no to Malthus

Contrary to the modern-day followers of Parson Thomas Malthus, Africa needs modern agriculture, simultaneous with infrastructure and urban industry. South Africa is proof positive that modern agriculture is possible on the African continent. Its low and unreliable rainfall means that only 12% of the country is suitable for dry land crop production (suitable soil with a slope under 15%, and sufficient, reliable rain that the soil can store and release for the crop). It would seem to be a most unlikely candidate to be self-sufficient in food production—but today, it almost is. Seventy thousand farming units employing 1 million rural inhabitants virtually feed the country of over 30 million.

South Africa tackles the problem of feeding its rapidly growing population by using modern technology and irrigation. South Africa is a world leader in the use of surface water resources for irrigation—78% in 1972, compared to 46% in the United States. On lands irrigated with state water, 70% is surface distributed, 29% by sprinkler, and 1% by drip. Since the very beginning of European settlement in the Cape in the 1650s, the question of capturing water for agricultural and other uses has been a central concern. Of the 52,000 million cubic meters (m³) of water flowing in South Africa's rivers, potentially only 31,000 million m³ per annum can be

FIGURE 1

South African economy dominates the continent



captured with dams for urban, irrigation, and hydroelectric use. Groundwater (through drilling of wells) can yield another 1,100 million m³ per annum. In 1980, South Africa's well-developed and expanding water capture and dam system was already capturing and distributing 40%—over 13,000 million m³—of this potential for all purposes, of which 9,600 million cubic meters per annum was for irrigation. In order to remain self-sufficient in food production, by the year 2020 South Africa intends to double the volume of water available for irrigation. If extremely dry South Africa can feed its population, then almost anybody can—with technology and skills.

Industry and apartheid

Compared to its neighbors, South Africa is characterized by a high percentage of labor employed in industry—29% in 1980, compared to 15% in Zimbabwe and 16% in Angola. By 1980, manufacturing and construction combined provided more employment than either mining or agriculture. It is this creation of an urbanized, increasingly skilled, industrial work force, backed up by an expanding infrastructure, that makes South Africa the hope of the entire region.

The single most important factor creating the conditions for the end of apartheid has been the postwar infrastructure and industrial boom. It has been the increasing demand for more and increasingly skilled labor in the industrial centers of the PWV region, Durban, and the Eastern Cape, that brought blacks out of the rural, subsistence agriculture existence, typical for most of Africa. Almost 80% of Africa's population is non-urban, whereas for South Africa, the figure is 50%, with 39% of blacks urbanized. With the end of the apartheid system's Pass Laws, South Africa began to plan major investments into urban infrastructure, housing, and education, for the expected increase in black urbanization.

For this reason, most industry and trade associations in South Africa realized early on that apartheid was becoming an economic irrationality, slowing down economic growth. The architects of this industrial growth became the political lobby for many of the reforms that are being implemented.

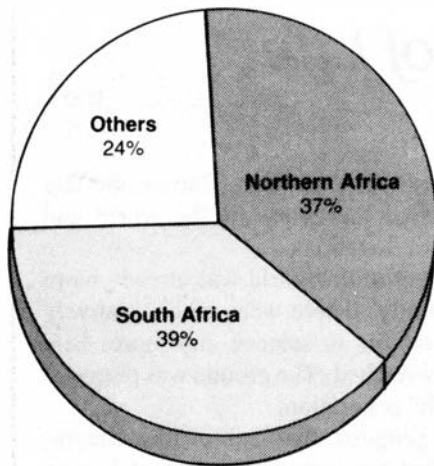
The composition of South Africa's labor force is without precedent in Africa. The growth from 1945-65 and 1965-75 represents the postwar takeoff. In 1948, with the coming to power of the National Party, new import controls were implemented to create import substitution industries. Thus, at the same time that the National Party began perfecting the bureaucratic apparatus of apartheid, they also created the demand for black labor that created the leverage for ending apartheid.

Imports as a percentage of total production declined from 62.5% in 1945 to 40.3% in 1955 and 33.8% in 1965. Domestic industries for the production of consumer goods accounted for much of the industrial growth, but the expansion of heavy industry and machinery was also taking place in parallel. Employment in production of metal products grew from 54,100 in 1951 to 135,500 in 1982—a 250% increase.

The growing importance of industry is also reflected by the fact that since the beginning of the 1980s, it has consumed more electricity than mining.

The year 1975 represented for South Africa and southern Africa a breaking point in the postwar industrialization of the region. Three factors converged to slow down the rate of growth: 1) The early 1970s shift globally to the idea of a "post-industrial society," with the proliferation of the zero growth movement, malthusian institutions like the Club of Rome, and the brutal imposition of such policies on the Third World via institutions such as the IMF and World Bank. The result of this shift we see most viciously in Africa today, with starvation, the AIDS plague, and the locust infestation. 2)

Agricultural tractors



The conscious decision by western policymakers of the stripe of Henry Kissinger to permit the Soviets and Cubans to implant themselves in the region, in Angola, as a permanent counterweight to South Africa's economic and military power. 3) The effect of apartheid on suppressing the rate of development of black skilled labor.

In 1975, some 1,308,000 people were employed in manufacturing and 484,000 in construction. By 1984, 1.4 million were employed in manufacturing and 415,000 in construction, showing a complete stagnation.

Probably the most serious, long-term damage of apartheid has been its impact on education and black labor skills. In the original apartheid planning, blacks were to live in homelands under a largely subsistence economic mode, with limited numbers of them being permitted under an "influx control" and a pass system to function within the "white" economy, when necessary. Dormitory systems for mining are a product of this, as well the semi-dormitory status that prevailed in many townships.

In the words of apartheid architect former Prime Minister Verwoerd, blacks should be educated for their "place" in society.

Forty percent of the black population aged 20 years and older in 1980 had no formal schooling. Skilled labor demand in the 1950s and 1960s was originally met by immigration from Europe and by raising the skill levels of whites. In the 1960s, one-half of the skilled labor requirement was met by immigration from abroad, sustaining 9% per annum rates of growth in industrial production.

While one could acknowledge that per capita education expenditures for blacks in South Africa are above most African figures, they were way short of what was required to build an increasingly skilled labor force. Between 1965 and 1983, for example there was no substantial shift in the skill

levels of employed blacks.

By the mid- to late 1970s, the South African economy had built up a physical infrastructure capable of sustaining a significant lunge forward in industrial capacity. Even if regional cooperation had been in place, the underinvestment in the "market basket" of consumption for blacks had created a mammoth skill deficit. As J.A. Lombard of the Development Bank of Southern Africa stated in 1981, "Because the South African production function will, to a far greater extent than ever before, have to rely on the supply of skills from the domestic black population, and because this means a costly and time-consuming process of industrial culturalization and urbanization of the available economically active population, the rate of increase of final output during the 1980s cannot for the time being reach the high levels of the 1960s." Because of the early recognition of this crisis, the architects of South Africa's industrialization began the process of reforms designed to make available to blacks the necessary access to modern industrial culture and its concomitant political rights.

Even with key aspects of the world economy in the hands of malthusian institutions, South Africa's dirigist commitment to bringing industrial culture to Africa could have made progress in the region, much the same way Japan has been able to be the motor for industrialization in the Asian Pacific Rim. By the beginning of the 1970s, plans were already being implemented for extending infrastructure north into the continent. Exploiting the fact that colonial Portugal had to seriously confront the question of developing its colonies, if it wanted to maintain any influence at all, South Africa negotiated the construction of the Ruacana Falls hydroelectric project in southern Angola and participated in the Cahora Bassa project in Mozambique. Built in part by South Africa companies, the projects were conceived as permitting the colonies (and later, countries) to develop their water resources by exploiting the economies of scale inherent in the electricity demand of South Africa. Dependable electrical power and water use supplies would be available in those countries for economic development. Both projects exist now, but largely underutilized.

In 1974-75, in the context of seeking a negotiated settlement to the Rhodesia crisis, South African Prime Minister Vorster and his representatives were discussing détente and co-prosperity schemes with Kenneth Kaunda of Zambia. But by the mid-1980s, Kaunda was calling for economic sanctions against South Africa. The difference was the Soviet-Cuban takeover in Angola, a permanent destabilizing factor in the region.

The postwar development of the southern Africa region, centered on South Africa's increasing industrialization and urbanization, created a very favorable and necessary interdependency among the nations of the region. It is the basis upon which a community of principle could be constructed for the region as a whole.

Editorial

Ten years for the Club of Life

It is altogether fitting and proper that in this special issue on Africa we mark an important anniversary: the first decade of the Club of Life, born on Oct. 22, 1982, in twin conferences in Rome, Italy and Wiesbaden, Germany. The Club of Life was founded to be the counterpole to the Club of Rome, then ten years old, which had become the international rallying point for anti-life hatred.

Helga Zepp-LaRouche and those who joined her in forming the Club of Life in 1982 saw the need for an institution which consistently stood up for the inviolable right to life for all human beings—a right no longer deemed self-evident. The jargon of “lives unworthy to be lived” and of “useless eaters”—once used to justify the crimes against humanity for which Nazi war criminals were tried at Nuremberg—had crept into the thinking of the world’s leaders. It took its most overtly brutal form in lies about so-called overpopulation in the so-called Third World.

In 1972, the Club of Rome, a coven of oligarchs and pseudo-scientists, had released a book—*Limits to Growth*—in many languages, along with a lavishly funded publicity barrage. Authors Dennis Meadows and Jay Forrester, MIT professors, asserted that they had proved by computer simulation that the “world’s limits to growth” had been reached, and that humanity could escape a threatening ecological catastrophe only through a strict adherence to zero growth. The book suppressed the fact that resources on each level of development are dependent upon the technological level which defines them, and that technological progress, when encouraged, constantly yields new resources.

A few years later, Meadows and Forrester dared confess that their study lacked any scientific basis, that they had simply fed the computer selected information to get the desired result. But by then, the debate manufactured from these fictitious premises had brought about the “paradigm shift” that baptized the international ecology movement.

Suddenly, man was no longer the crown of creation, but a monster, who fouled the living space of frogs and owls. Step by step, people got used to this thinking. Soon it no longer mattered that an entire con-

continent, Africa, might starve to death. Rather, the fate of two whales excited the hearts of the world and brought in millions of donations.

If the development of the world was already more or less over, why study? There were no qualitatively pioneering breakthroughs in science any more. Life became boring and wretched. The ground was prepared for the “zero-growth” generation.

To oppose this *Zeitgeist*, the Club of Life uncompromisingly defended the inviolable value of human life based on natural law, which proceeded from an image of man which understood each person, no matter what color or from what part of the earth, as *imago viva Dei*, created in the living image of God. Those principles were elaborated in a little book by Lyndon LaRouche, *There Are No Limits to Growth*, which the Club of Life published in English in 1983 and since then, in several other languages.

In its decade of activity, whether engaged in the battle against abortion and euthanasia, for an effective fight against the AIDS epidemic, or for the development of the southern hemisphere, the Club of Life always began from the principle that human life can only be effectively defended if the current world order is replaced with a new, just world economic order in harmony with the principles of the papal encyclical *Populorum Progressio*.

The Club of Life was one of the few North-South organizations which demanded an end to economic underdevelopment without falling into the trap of pitting poor countries against industrialized ones. At thousands of meetings, conferences, discussion circles, and information stands in Europe, North and South America, as well as Thailand, India, and Zaire, the proposed solutions of the Club of Life were put forward and helped to build a worldwide movement against the anti-science outlook of the Club of Rome.

Today, when the Club of Rome’s satanic creed of human sacrifice has become the unacknowledged state religion of most governments, the Club of Life is more needed than ever, to defend obedience to God’s first commandment to man: Be fruitful and multiply, fill the earth and subdue it. Long live the Club of Life.

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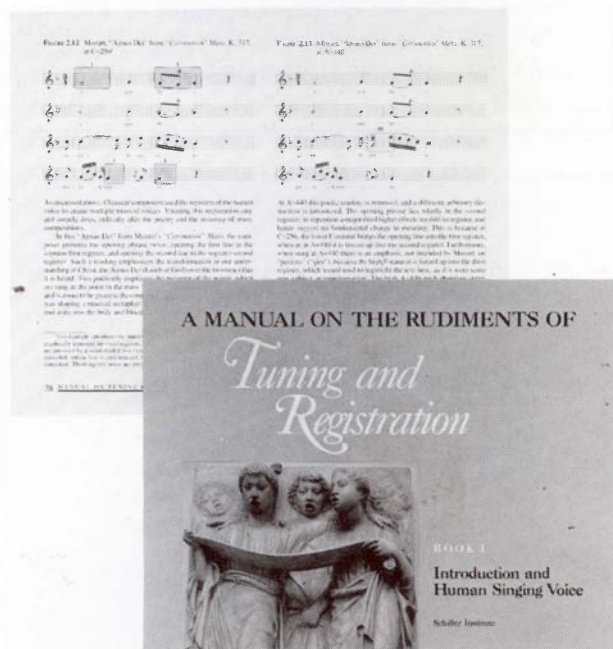
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