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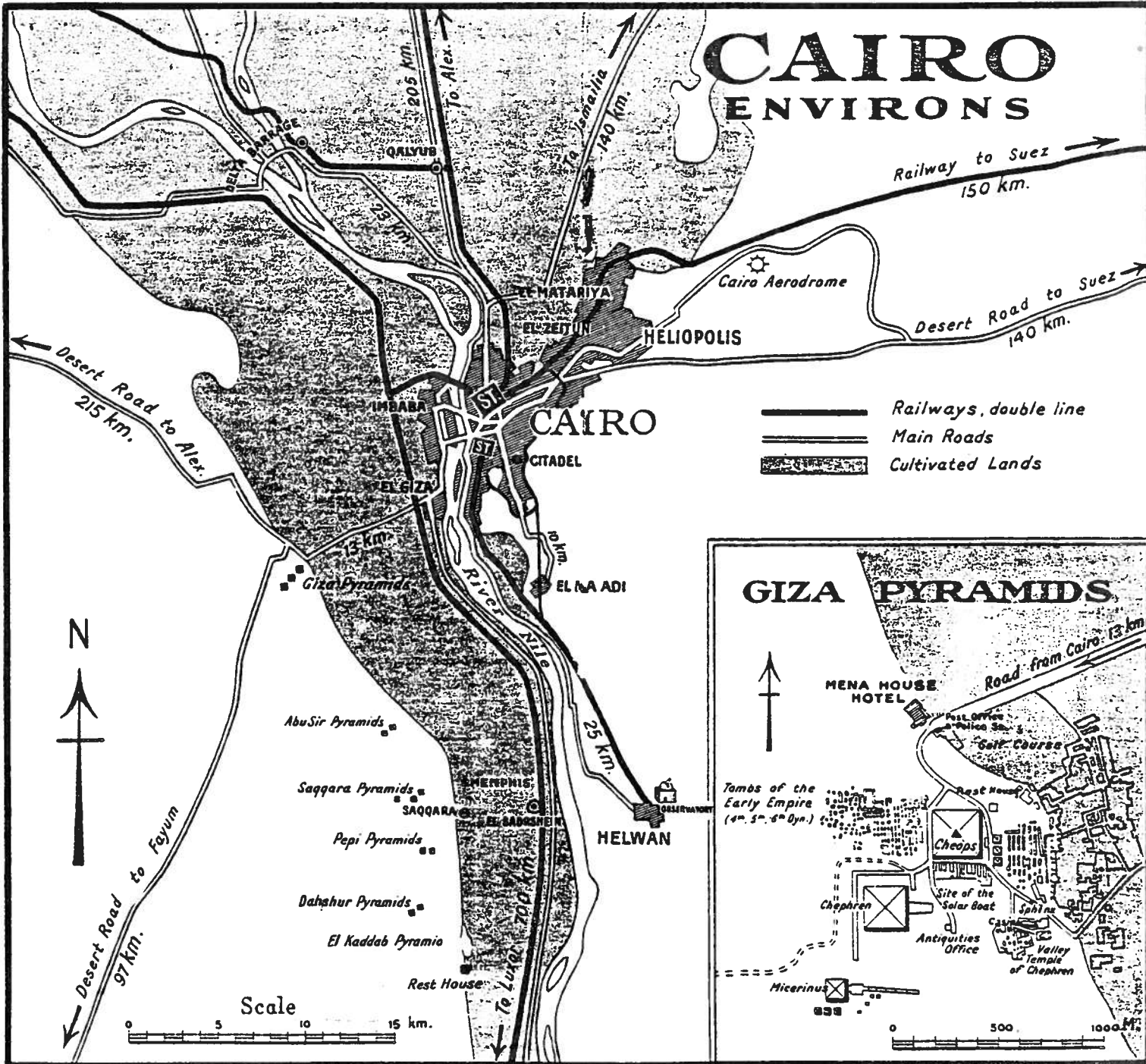
CAIRO:
Can a Bureaucratic Metropolis Committed to Subsidies
Survive Energy Shocks?

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CAIRO: Can a Bureaucratic Metropolis Committed to Subsidies Survive Energy Shocks?

Richard L. Meier

Introduction

This study of Cairo was conducted during the month of July 1980. It is one of a series of overviews of Third World cities that I have been undertaking. As each case was added an explicit and extraordinarily useful model evolved which draws upon living systems, or ecological principles.

In the past two years this effort has been focused upon a problem that is common to all ecosystems--energy supply. Each city must find an organized response to striking increases in cost and possible discontinuities in supply, or large parts of it will emigrate or die off.

Each metropolis has evolved a unique ecostructure, so each should respond to changes in global conditions in its own way. Thus, through urban ecological analysis, I hope to discover special opportunities that allow minimization of injury and promote a healthy resilience to foreseeable calamities. Steady state is a higher priority than growth; integration is more desired than strength.

I. Context

Cairo will always be listed among the top ten metropolises of the world whenever population size, influence on world affairs, contributions to culture, and significance in political development are considered. It dominates the most populous Arabic-speaking nation, so it has become the hub of a culture that is rapidly moving into front rank despite its disunity.

This role has long been evident, so in my earlier studies of the futures of Third World cities in Asia, I was forced to take account of the precedents set in Egypt. Therefore Cairo is the only city not physically on the continent of Asia that is included in *Urban Futures Observed: In the Asian Third World* (Pergamon, New York, 1980). Its influence was detected all the way across Asia to the rural precincts of central Java, as well as the desert fringes of Morocco and the *gecekondus* (informal settlements) of Ankara. The first visit was made in the summer of 1976, and it addressed itself to what had been added to Cairo since the completion of the work by Janet Abu-Lughod for her magnificent historical and social ecological analysis, *The City Victorious: 1001 Years of Cairo* (1971). How would the Egyptian megalopolis grope for form and order? This assessment will carry on to pick up other crucial elements in metropolitan destinies.

Centuries ago Cairo was vulnerable to the closing of the caravan routes to the Far East. It also had to be concerned with the power and the machinations of the barbarians who sought to take the city, slaughter its inhabitants, and appropriate their wealth. The caravans have been displaced by world trade at a thousand times the historic scale, and the predatory tribes have been succeeded by conspiratorial nations, and the battlefields have now become negotiating tables and forums of the United Nations. The wastage of human life and wealth has been greatly reduced in the course of the transition, but nations, and the cities that manage their actions, are still vulnerable. In order to survive whole and healthy, they must mobilize *knowledge*—stocks of information organized by a body of concepts—to find a path of action that is good for them. Some hazards are neutralized, others are converted into opportunities.

Drawing upon the information published in newspapers, trade journals, and statistical abstracts available in 1979 in America and Europe, I judged Cairo to be one of the most vulnerable large cities in the world. It was seen as slowly improving its management of Egyptian territory, but unable to do much about its Achilles heel, the energy requirements. Although oil had been found on the fringes of Egyptian territory in sufficient quantities to energize Egyptian cities, the bureaucracies have induced a pattern of fuel and food distribution that is utterly

inappropriate to the scarcity conditions anticipated over the next decade or two. Most of the butane gas that sustains contemporary Cairo is imported from across the Mediterranean, while the crude oil from the new fields is largely refined outside. A huge mismatch has been allowed to evolve, and the policy changes announced by the various Ministries are worsening it. Parallel problems exist with respect to bread and cooking oil, the principal sources of calories that keep the households functioning.

Cairo's energy future is seen to be different from that of other metropolises in its size range primarily because it is trapped in a system of subsidies arranged by bureaucracies to satisfy the felt needs of national leaders and their clients. Major long-term welfare is being sacrificed to maintain certain salient relationships for the short run. Normally the evaluation of such policies is addressed by employing the concepts and principles of political economy. Because much time and effort is spent teaching neoclassical economics, one expects clarity and precision from it in the final analysis; unfortunately, lucidity is seldom achieved in that idiom, even for the minority who are technically trained. I will attempt a larger perspective, based upon common sense and close observation, employing statistics only to the extent that they seem reliable. Perhaps Cairo's predicament will be made more understandable, and the policy options that emerge will be better supported by using urban ecology, even though the basic strategies remain very much the same. The focus here will be upon the massive community of Greater Cairo rather than the urban sector of Egypt, because it is not only the seat of controls (governmental, private, and religious sectors) but also the precedent-setter, the pacemaker, and the transmitter of ideas. Distributory arrangements that fit Cairo can then be disseminated elsewhere.

The discussion will be conducted in the following sequence. First will be a brief introduction of terms and concepts of urban ecology which permits comparisons to be made between cities and the local adaptation of successful strategies innovated elsewhere. Second will be a specific example of the evolution of a policy that is rapidly approaching a calamitous dead end and one which illustrates the uniqueness of Cairo. Third will be a representation of the ecostructure of contemporary Cairo expressed as quantitatively as permitted by data combined with observation. Fourth will be a presentation of the normal inputs and outputs, the prospective interruptions in flow, and the expected adjustments to such interruptions. Finally there will be a synthesis of strategies which appear to be appropriate to food and fuel over the next decade or so. The readership is expected to be people interested in Cairo, both from the inside and the outside. I am conducting this study without sponsorship or special grant, but because Cairo presents an intriguing intellectual puzzle, and I had an opportunity to make a visit of limited duration.

II. The Model

Everything to be found in an urban community has a *life cycle*. Each item has strong similarities to others so that it may be regarded as a member of a *population*. For each population there are normal means of reproduction or production, normal sources of death and destruction, and normal distributions of lifetimes for the survivors. If the population is a living species, it has been named, observed, sometimes counted, and its requirements have been identified; the supportive environment for it is called a *niche*. If the population is made up of a kind of artifact, equivalent information can be collected. People, living organisms, and smaller artifacts are associated with each other, and with a *built environment*, in households, neighborhoods, communities, and many varieties of organizations. The totality is an *open system* which maintains itself by drawing upon resources in the external environment and rids itself of waste products.

A living system maintains itself through a continuous flow of *transactions*. Kenneth Boulding, when considering basic characteristics of such transactions, abandoned the economists' categories of labor, land, and capital and, in his *Ecodynamics* (Sage, Beverly Hills, 1978), was forced to select *energy*, *information*, and *matter* as basic components in the production of things (or services) of value to individuals, their associations or organizations, or the system as

a whole. Bioecologists had, a generation back, recognized the fundamental role of energy, but the economists had formulated their basic assumptions just before the Laws of Thermodynamics had been fully established. It is possible for ecologists to treat issues related to energy and matter as a direct extension of the appropriate sciences, but they still encounter some difficulties in the measurement of information.

The dominant species in a city is man, so we may be forgiven (by environmentalists, spiritualists, and others) for concentrating our attention on the human population. The life cycle involves conception, gestation, birth, infancy, puberty, adulthood, and aging over a period that can average as much as eighty years. The population can be divided into several races, which have become quite mixed, and thousands of specialized categories which have roles to play in the ecosystem. The population requirement for food energy is in the range of 2,200-2,600 Calories per day per capita, and ten to a hundred times that much for the artifacts that permit individuals to move about and play chosen roles. Information inputs have a much wider range, but a large share of the time before puberty needs to be assigned to education, and a leadership stratum continues the educational phase much longer. The bulk of the matter in a city is incorporated into the built environment. The spent energy is radiated to the skies, the used information is scrapped or forgotten, while materials are sometimes salvaged and recycled.

The various species compete for space, energy, water, and other scarce resources. Those that fail to compete adequately are squeezed out. Organizations compete along with the others; they tend to be concentrated near the core of the city on sites with the greatest access to other sites. The built environment of the central city is designed to maintain a large number of organizations that engage in intense interaction with each other. That part of the city is designed to propagate new organizations and nurture those already in existence, but obviously some cities have provided better conditions than others.

Cities that maximize the flow of transactions, including the nonmarket types, achieve a competitive edge over cities with a lesser flow. They tend to acquire more than a proportionate share of scarce resources; their response to challenges and opportunities is quicker; their collective problem-solving capability is superior. Therefore those cities which find ways of expediting the number and variety of transactions grow stronger, and often larger, than the others. We must also conclude that cities like Cairo have found formulas for enhancing the volume of transactions, and each formula will involve the uses of proximity, of time, of associations with machines and other artifacts, as well as the communication of information. For the local residents all the features of this formula are buried in their subconscious, so they cannot describe how they do it, any more than a bicyclist can describe what he does to keep defying gravity.

Finally, we must ask what might be the ultimate output from city life. After all the fuels have been burned, the food digested, the water run off in sewers, the materials used and scrapped, what is conserved? The answer is abstract—cities accumulate *knowledge*. Knowledge is that part of information flow which is useful over the long run; its life-cycle potential enables it to last over decades, or even centuries. Knowledge, therefore, is a stock of information, and cities which have large stocks tend to cope better than those with limited stocks. The preceding propositions were put forward and defended in my book, *A Communications Theory of Urban Growth* (M.I.T. Press, Cambridge, 1962), but the measures of knowledge in real cities remain elusive. Knowledge resides in the heads of people with experience, in the files of organizations, in libraries, museums, and archives, in computer simulations, and in esthetic judgments. Knowledge reduces risk—it adds to the likelihood of survival—but it can also inhibit decisions because it adds to the imponderables.

These fascinating properties of urban ecosystems are recapitulated visually in the diagram in Figure One. It tells us what should be looked for when gauging ecostructure, inputs, outputs, and capabilities. It indicates what questions should be asked when one is inside the system, that will yield dependable expectations, *i.e.*, win bets about what happens next.

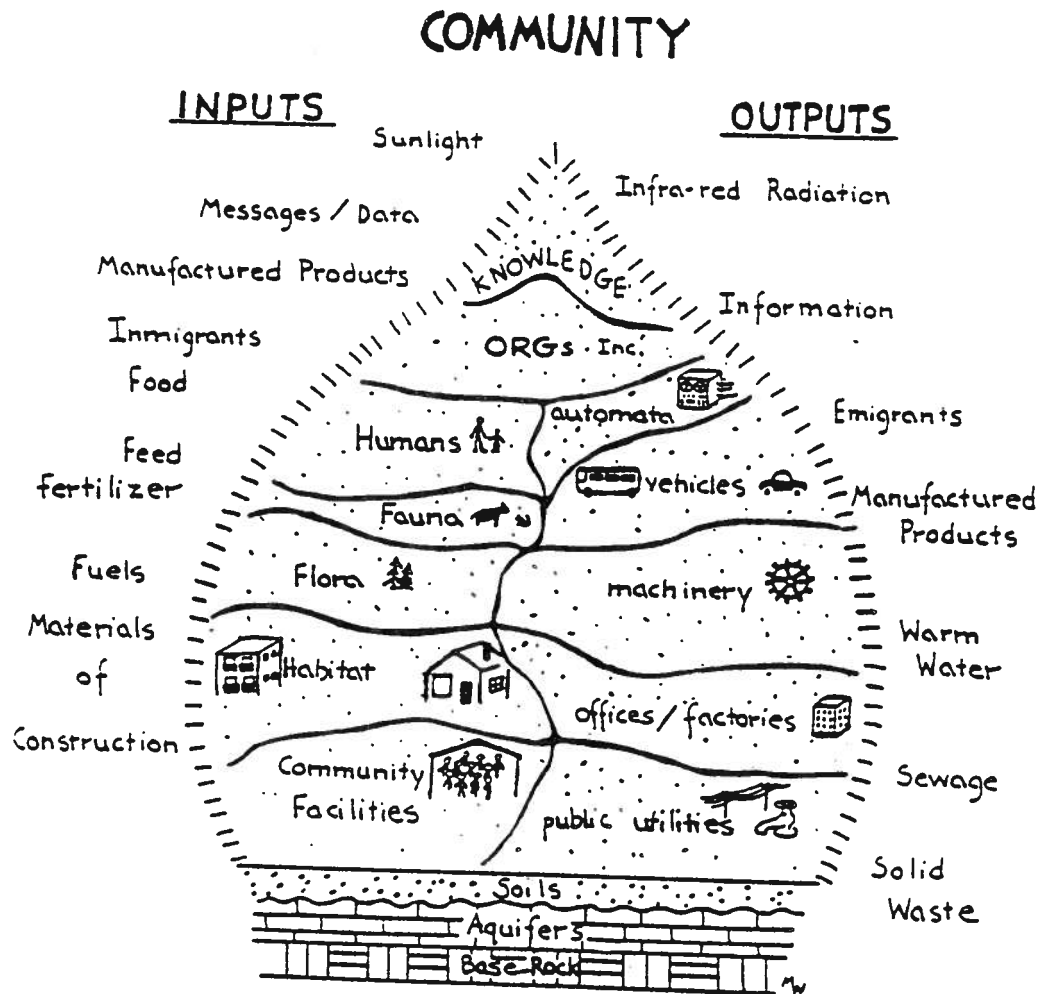


fig One: The Urban Ecosystem as Energy Converter

III. The Subsidy Trap

Energy is almost free in Cairo in 1980. The consumer pays for the services that deliver the energy, but he pays virtually nothing for the energy itself. The retail price of the most common household fuel is about a sixth of the world wholesale price. Since the wholesale-retail mark-up is twenty percent or more of the wholesale value in developing countries, it is fair to argue that the commodity itself is provided free—even though it is imported at the cost of scarce foreign exchange!

This miracle is repeated in the other category of energy, where the world prices are three to five times as great per calorie. Bread, the staff of life in Egypt, is sold retail for 0.7¢ per piece for the nutritious (92% extraction flour is used) *balady* unleavened variety. The more refined, and therefore less nutritious, breads are double, quadruple, or even more, but they too are priced at only ten to thirty percent of the cost of the imported wheat.

But this is not all. Virtually every commodity needed for living in Cairo, from electric power to soap and cooking oil to watermelons, whether for the poor, the middle class, or the power elite, also merits a very heavy subsidy. How does Cairo do this when other Third World cities are struggling with newly set prices of a dollar a liter for liquid fuel, and a dollar for a half-kilo loaf of bread, when they import fuel and food?

Why cannot other cities follow Cairo's formula? The explanations go back for almost a century, but the principal body of precedents was established over the last two decades.

The early precedents lie with the administration of the Ottoman Empire. The perception of it that comes through to me from English-speaking Cairenes (this provision defines them as at least amateur scholars) is perhaps more important than the pronouncements of the historians. First there was a meritocracy which found competence from among the military, the Byzantine aristocracy, the old bureaucrats' families, and even among the slaves. The properties selected for were a capacity to lead in an emergency, for brilliant improvisation, and a capacity for collecting and transmitting tax moneys without disturbing the local economy. The ideal Ottoman bureaucrat was alert to the factionalism and intrigues in the city and the movements in the countryside. He had an encyclopedic knowledge of the arts, which included technology, because the technological innovations of that time were the product of urban artisans. He had a respect for religion, because he was commissioned as a "Defender of the Faith."

An administrative service made up of a few representatives of this ideal type, and many pale imitations, had no comprehension of economic development. Their task was that of preserving order. This was accomplished by using political power and judicial authority to sustain traditional relationships. The system was tolerant of many customs and religious heterodoxies—so long as they did not convert or subvert the Muslims. It did not understand economic growth, and indeed very often viewed growth phenomena in a district or a city with suspicion, because it might become the base for power that contested their authority.

Thus the unwritten rules in Egypt—the safe standards for action—are to preserve order among the masses by maintaining traditional relationships as long as possible. The public priorities have shifted to the promotion of economic and social development. However, between the reasoned policy papers of overseas-trained civil servants and the ultimate ministerial decision the shadow of tradition intervenes, counseling caution.

The Ottoman system was no match for the British or the French, so the aristocrats, top bureaucrats, and merchants sent their sons to the fountainheads of knowledge in Europe and later to America. They studied engineering, medicine, law, and literature, and absorbed concepts of social justice and Marxism along the way. The idea of governmental subsidies for social purposes is most highly developed in the West, but it found fertile ground in Egypt after the king was deposed.

Affecting this accretion of generally accepted ideas is the body of Islamic doctrine, particularly the Koranic prohibition of usury (interpreted as any kind of interest payment by most theologians). The Muslims in government never had a feeling for the nurture of capital, or a sense about what were appropriate returns from investment. Until the late 1950s they did not

need to, because the urban society could depend upon the Copts, Jews, and Greeks to manage the capital. But the loss of almost all the Greeks and Jews during the wars of that period, and the retreat of the Copts into the anonymity of Muslim surnames, left the newly socialized enterprises in the hands of a poorly trained managerial cadre. Thus each time the Government wishes to placate unrest it declares a subsidy; if it desires instant popularity within a stratum of the population it declares another subsidy.

As this is being written, an announcement arrives that the Government is making special provision for the forthcoming celebration of Ramadan—a month of daytime fasting and of nightly feasting for those who can afford it. The supplies of meat, sugar, and cooking oil previously sold at thirty percent of the market prices are to be tripled, and unlimited quantities of frozen (imported) meat will be available at controlled prices which are ten to thirty percent subsidized. Other commodities associated with the festivities are assured to be in plentiful supply at controlled traditional prices, regardless of the shifts in world markets.

The money comes from foreign assistance, with the Russian sources being displaced by the much more magnanimous Americans, the World Bank, and other United Nations agencies. More comes in the form of remittances from the million and a half Egyptians working as expatriates in the Middle East and Libya. The operation of the Suez Canal brings in a tidy sum. In the past year or so Egypt's oil production rose to a level that put it into the club of non-OPEC oil-exporting countries, and it obtains world market prices (often above OPEC's) for the oil. Industrial output is expanding at a rate of seventeen to twenty percent per year, even though few of the enterprises are making profits. If these sources are not adequate, the Government has not hesitated to print money to meet its obligations, although that has not been necessary for the past eighteen months since the Egyptian pound has hardened with respect to the American dollar by about five to ten percent.

Thus Egypt as a whole is making economic progress more rapidly than most developing countries, and Cairo has never been more prosperous since the halcyon 1920s. Buildings are rising on the skyline in all quadrants. Only a few years ago the economy was on the brink of the abyss; politicians were walking tightropes. They did this with some aplomb, because the country had been like this for two decades.

Given their past experience, it is no wonder that Egyptian ministers wonder about what they are doing wrong. It may run against the rules of finance that apply elsewhere in the world, but in Egypt their policies seem to work. The International Monetary Fund was, of course, horrified at the trend toward enhanced subsidies, so it brought very strong pressure upon the Government. In January 1977 new fixed prices were announced which removed part of the subsidy on bread and other necessities. The riots that followed were more severe than expected, even by President Sadat, who seems to understand the present system very well, and uses those insights to maintain his power base. So the subsidies were restored, and were later extended somewhat. The International Monetary Fund stands by watchfully, wondering what to do when what they perceive to be a bubble will burst and leave a clutter of unpaid obligations.

This background makes it possible to understand the energy subsidy and its consequences for Cairo in the 1980s. Butagas was introduced into Egypt in the early 1960s. At that time butane was absurdly cheap because it was a refinery byproduct of trivial value. It could be converted into high-test gasoline, but only by investing sizable sums in politically unstable areas in the Middle East. The alternative to burning it at the refinery was to sell it as bottled gas and a substitute for the more easily handled kerosene that had already been introduced into Egypt for cooking and lighting. It was accepted slowly by the Europeanized urban population because it was cleaner and more modern. In 1975 estimates prepared by the ministries suggested that roughly half of the urban domestic fuel had become butagas; since then it has taken over virtually all of the market in Cairo, especially the inner city.

This butane is currently produced in refineries in Egypt, but the supplies are extended from large refineries on the Mediterranean (Athens and Taranto). It is no longer a surplus byproduct, but has become one of the more highly valued components of petroleum. The price

has risen accordingly, particularly since 1974. By that time the distribution system had become a national enterprise, so no official action was required to raise the price. But officials had more important matters on their mind, such as the planning of military campaigns. So the subsidy was swallowed and the internal price left alone. Inflation caused the real cost of energy to decline over recent years. So far the necessary dollars have been obtained, so no nationwide shortage has occurred, but local breakdowns in distribution have been experienced. The designated public agency has been relatively efficient in coping with rapidly increasing demand.

The butagas is delivered in bulk as a liquid in a moderate-pressure container to a station which fills standard steel bottles containing twelve kg of liquid butane. The set price for such a bottle is sixty piastres (\$0.87 at the official rate of exchange, and 70-80¢ at the "parallel" market rates), and a set price of five piastres for delivery. But one must trade in an empty container to obtain a filled one. Their price also was fixed at thirty-five pounds (\$50), which drops to twenty-four pounds for a second-hand one. At least those are the regulations, but in reality things do not happen that way.

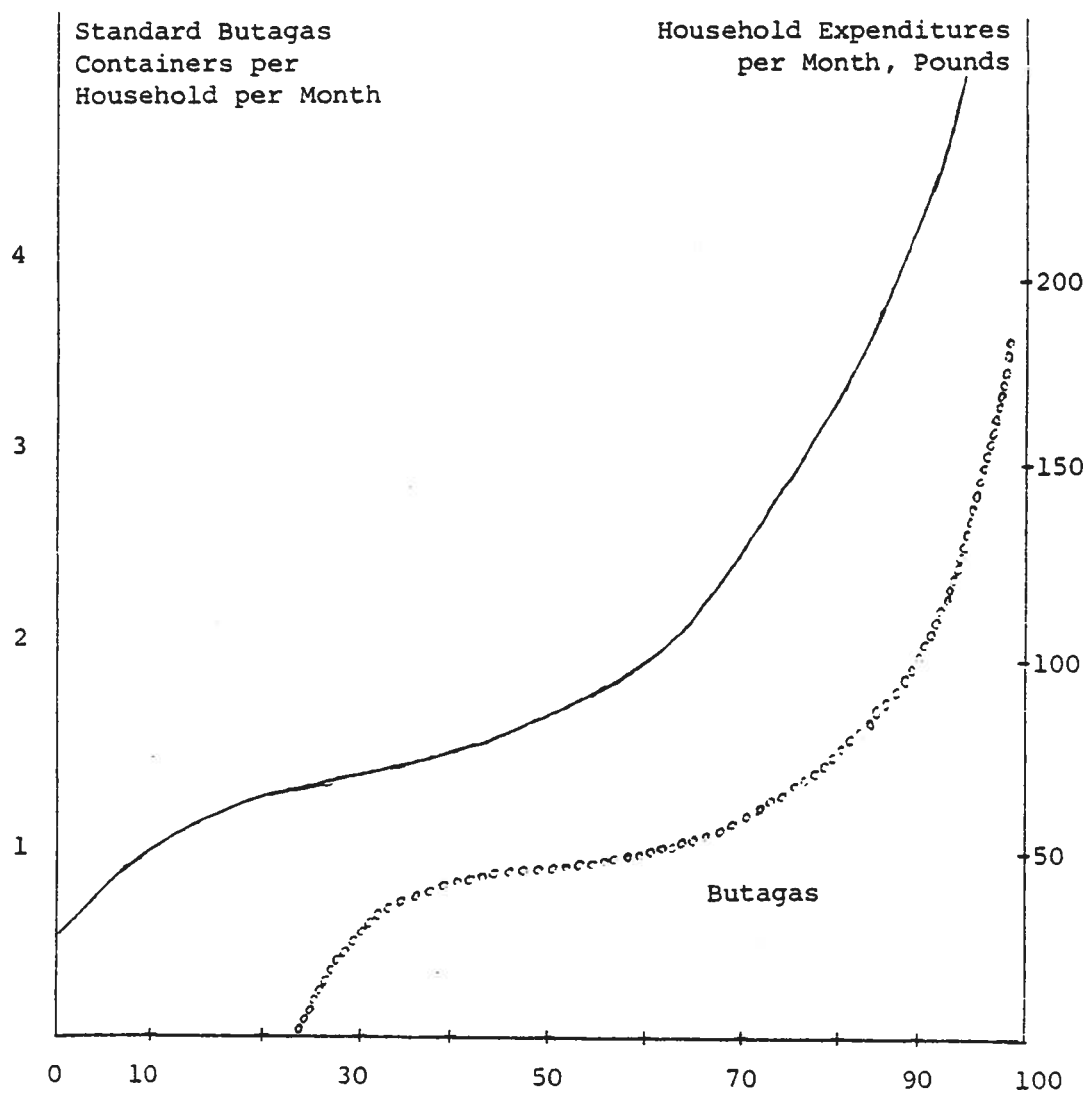
Cylinders are scarce, so one must pay sixty-five pounds (\$95) to obtain one, regardless of its age, to get into the system. This is quite a sizable initiation fee. The actual price of the refill is variable. Delivered in the poorest districts, it is said to be seventy-five piastres. There it lasts about three weeks, handling the cooking and washing needs of a household of six persons. In the best suburbs with many luxury apartments, a man with a small truck charges one pound (\$1.45 official rate) and in some instances even 110 piastres. The value of this amount of energy elsewhere in the world would be at least 450 piastres. When scarcity threatens, this middleman will refuse to deliver to a servant, because the servant will try to negotiate a cut for himself.

An unsigned, undated USAID internal memo reports that an estimated 2,000,000 butagas stoves and 270,000 heaters have been sold. Since the growth in use has been very recent, probably ninety percent of these are still in operation. This magnitude of use fits qualitative observations made in Cairo, so it seems reliable. The volume consumed was reported to be 28,000,000 kg/month. It is also possible to assess the implications of the current subsidy for the pattern of household expenditures, drawing upon data presented in the same memorandum (Figure Two). The updated analysis shows that the bottom quartile of Cairo gain nothing from this subsidy, that the working class and lower-middle salaried class augment their income by about four percent, and the remainder from the fiftieth percentile to more than the ninetieth gain about three percent. To put the conclusions in another way, paying the full price of this form of energy would require three to four percent extra expenditure for the average man seen on the streets; for the people seen in the automobiles it is three percent or a trifle less. This is a substantial portion of income, so the adjustment to world prices would have to be negotiated in several stages. This is also the portion of the population with the greatest influence on policy, so that adjustments can only be made when the situation is clearly understood.

The subsidy on bread and rice is much more substantial. The cost delivered to the consumer at little hole-in-the-wall delivery points, or from covered handcarts, is less than a tenth of costs elsewhere. The share of household expenditures allocated to grain products is shown in Figure Three. Bread is at least a progressive subsidy, since the poor profit more than the middle and upper classes. At the bottom ten percentile level, about eight Egyptian pounds is spent on grain products out of an income of fifty pounds per month. If sold at world market prices, the bread consumed would cost more than total income. As is to be expected, the wage levels have been depressed to take into account the grain products subsidies. Changes in bread subsidies must be accompanied by differential wage rises. The poor man's wage would have to be increased by at least fifty percent if the bread ration were abolished. Substitutions for bread (rice, potatoes, sweet potatoes) would occur, and wastage would disappear.

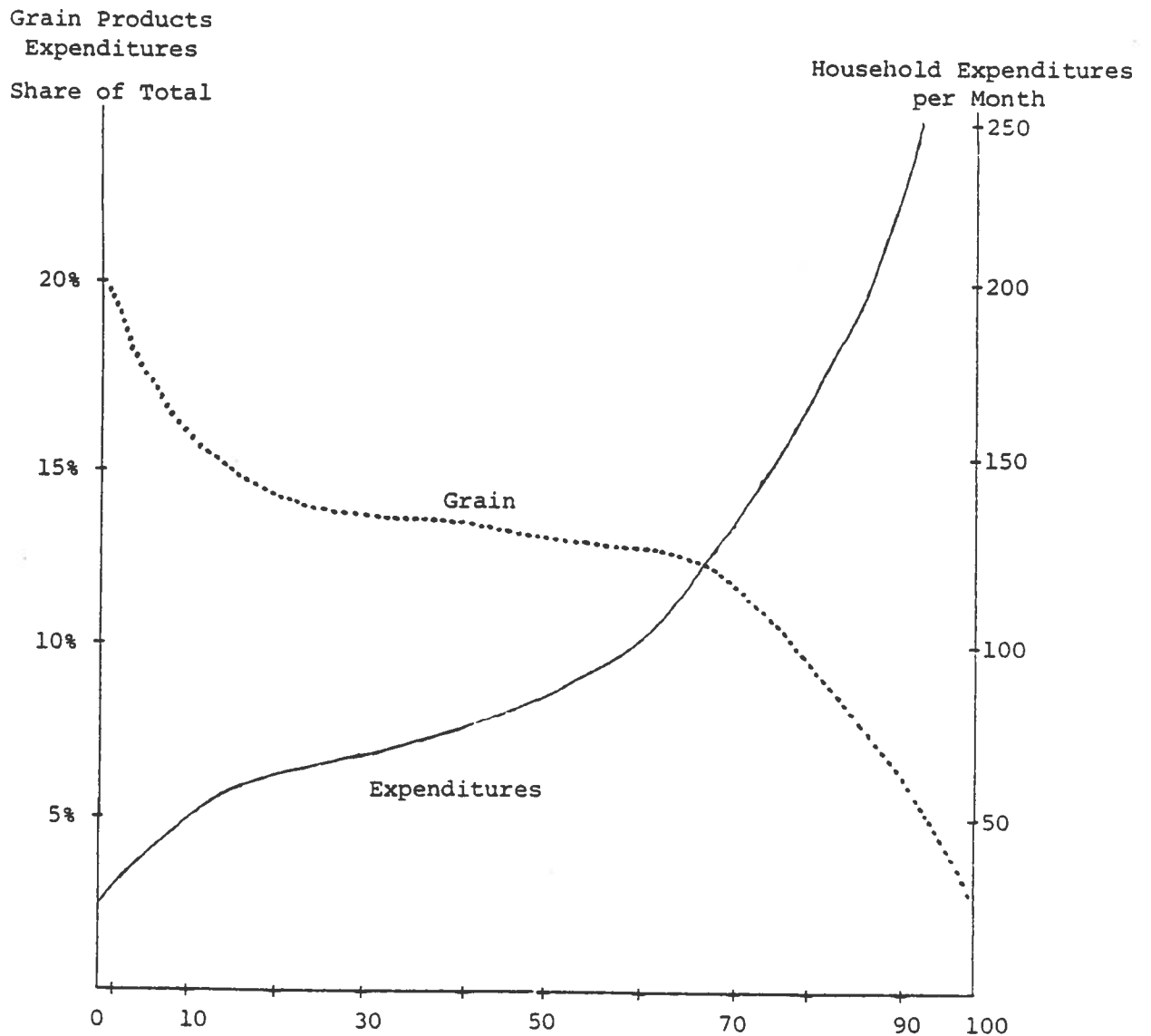
It should be noted that bread policy changed very recently, according to reports in newspapers of July 6, 1980. The net profit has been doubled to a level of thirty-five piastres per sack for the *balady* and *shami* breads and 450 piastres for the *afranji* bakeries. The white *balady* would weigh 169 g. per loaf, and the *shami* 122 g., and both sold for 1.0 piastre

Figure Two
Butagas in Urban Households, 1980



Assumes 75% of the households are equipped, and expenditures are about 10% above 1979. This graph allows one to calculate the impact of the subsidy on the various income strata.

Figure Three
Bread in Urban Households, 1980



These graphs allow one to estimate the impact of bread and grain products subsidies.

(equivalent to 3.3¢ and 4.6¢ per pound of bread at current exchange rates). Confectionery shops and biscuit factories were given additional discounts on flour, and macaroni was dropped twenty percent to 7¢ per pound. Wages of bakery workers were raised and they were given social insurance.

IV. ECOSTRUCTURE

Structure is usually communicated as some kind of snapshot view. For Cairo that would be misleading. The crucial feature of Greater Cairo is exponential growth. This will show up in a simple city in a flat plain as annular ("tree ring") expansion. The indicators of age, better yet, of "newness," are most revealing. The eye is better than the camera for gauging the vintage of a building or an image. Thus the principle of life-cycle analysis causes us to look at ecostructure quite differently from the physical planners.

Because Cairo is corseted by a 300-500-meter escarpment on the east, and sterile, shifting sand to the west, the normal growth presses to the south up the narrowing Nile Valley, or to the north into the spreading green Delta. But that same growth treads down, bulldozes, and builds over the intensive gardens and laboriously tilled fields that provide freshness and variety in the basic cuisine. This urban version of the Malthusian dilemma was sensed long ago, but as long as the Nile had variable flooding, and safety factors could not be fixed, nothing was done. The threat became more explicit after the Aswan Dam permitted close control of the level of the Nile. It was obvious that the first fifty families to settle a hectare on the growing edge felt that homes in a green environment were more important than vegetables and fruits produced by the same land. Moreover, the fifty would become five hundred in two decades of densification, and their preferences for a house on a small plot with a few trees in sight would emphatically be favored over a ten-percent addition to their salary.

In the early 1970s the city planners decided on a partial solution. New cities should be hived off of the metropolis, and they should grow up in the stony plain where fertile soil is not preempted. One such development, the Tenth of Ramadan, lies midway between Cairo and the Suez Canal, a sere, dusty grid of partially completed neighborhoods. As always happens in the building of new cities, the introduction of the essential services cannot be coordinated, so the place is not yet livable except as a construction camp. It takes a leap of faith to believe it will attract and support 500,000 erstwhile Cairenes.

1. Boundaries. Greater Cairo has already engulfed its satellites and has spilled out beyond them. Commuters come in from as far as Helwan and Saqqara more than fifty kilometers to the south, and Banha in the Delta to the north, about the same distance. At its widest Cairo is perhaps fifteen kilometers across. In between, much of the land is still cultivated, and the boundary between informal settlement built two to four floors high and the growing crops is often very sharp—as little as one meter's separation. The scatteration at the edges and the ends becomes denser every year.

Three governorates control the territory of metropolitan Cairo. Virtually the total population of the Cairo and Gaza governorates belong, but a large share of Kalyubia must now be added. The area of settlement is not readily defined, but it is not far from 400 km².

2. Population. According to the November 1976 Census, these three governorates contained the following populations:

Cairo	M	2,607,000	
	F	2,477,000	5,014,000
Giza	M	1,247,000	
	F	1,173,000	2,419,000
Kalyubia	M	870,000	
	F	804,000	1,674,000
Total			9,177,000

At the time of the Census perhaps a half million of these were engaged in agriculture and were not urbanized.

The male and female counts are shown, because they suggest that the Census itself may be very faulty. It is not uncommon for metropolitan districts in Africa and Asia to accumulate a surplus of males, but then the rural districts will register a deficit. This is not the case for Egypt, however, because each governorate except Aswan records a substantial surplus of males. Egypt as a whole, according to the Census of 1976, contains about three to four percent more males than females. The deficiency of females is not attributed to infanticide or poor nurture, even considering the preference for sons. If such traditions were demographically significant they should have had a greater effect in Censuses before 1966, but that has not been the case. The Director-General of the Census admits that the 1966 Census counted two percent more males, and the 1976 Census almost four percent more males, but points out that Jordan and Iraq have recently registered figures with similar proportions. (It is possible that these countries, lacking trained personnel, may have borrowed Egyptian interview schedules and administrators. This should be checked.)

The discrepancy for Egypt is actually far worse than the Census suggests, because about 1,600,000 were expatriates, a very large percentage of whom are known to be male. Thus the excess of males may be six to seven percent for Egypt, and as high as ten percent for Cairo. No one knows whether some males were counted twice, or some females not at all. Until the puzzle is solved, Egyptian statistics must be treated in a very rounded fashion. Our best estimate is as follows:

Population of Egypt (1980):	40-45,000,000
Population of Greater Cairo (1980):	10-12,500,000

The life expectancy for Cairo is greater than for Egypt as a whole, so we must assume that it is about sixty years. Similarly we expect the age level to be lower, the mortality to be lower, the level of education to be much higher, the age at marriage to be later, and the birth rate to be lower.

Since 1974 Egypt has exhibited, almost alone among Third World countries, a ten-to-twelve-percent rise in birth rate. Because the death rate is rapidly declining, this excess fertility causes a twenty-to-twenty-five-percent spurt in the population growth rate, raising it to 2.9-3.0 percent per year. Again, there is no rationale; the hypothesis of a postwar "baby boom" has been demolished by its duration. These reports are independent of the Census, so errors will have different sources and dimensions. No one can say as yet the extent to which Cairo differs from the remainder of the country.

The need for family planning is obvious to everyone, officials and visitors alike. A sophisticated, multi-objective family-planning program, reorganized to prevent the errors of the first decade of activity, has been in effect since 1975. Assistance has been provided by the United Nations and the United States. Contraceptive materials are priced like domestic fuel and bread—only the final distribution costs are charged to the consumer. According to latest reports the acceptance is there, even in the overgrown villages of the Delta, and the materials are now moving through the retail outlets at a rate that makes it difficult to keep them supplied.

All factors are present which suggest that 1980 may be the turning point. The participation of the women in the educational system has been steadily improving, and women are more independent than elsewhere in Muslim society (exceeded only by Teheran before the fall of the Shah). The management problems, as in all public-sector activities, have been most serious (cf. M. T. Hassouna, "Assessment of Family Planning Service Delivery in Egypt," *Studies in Family Planning*, Vol. 11, pp. 159-166, May 1980). The mobilization of the private pharmacies and private practitioners, starting in 1979, may be an appropriate signal for the change. The lag

in the collection and processing of data is greater than average in Third World cities, so no one will be able to demonstrate the rightness or wrongness of the judgment before 1984.

3. Fauna. The animal populations of Cairo give it a special ambience. The most populous species is the cat, probably a more direct descendant from ancient times than the people. Most are not domesticated, but live in the environment created by Cairenes. They are smart enough to invade virtually any garbage container, but are cleaner about it than rats or dogs, so they are tolerated. Cats in Egypt today would not survive without bread, because the juicier tidbits are too rare. The local breed makes few sounds, except when courting during the early morning hours, when they sound too much like ailing, impatient infants.

Cats (1980): 2-3,000,000

Another well-distributed species is the chicken. The evidence is strongest at dawn when the cocks are crowing. They seem to be equally distributed among all the floors from basements to roofs. The chickens eat table scraps, which means the staple of their diet is bread. Many more are raised commercially on the fringe.

Chickens (1980): 1-2,000,000

Very common on the streets are donkeys. They pull a great variety of antediluvian carts and wagons. Many of the green vegetables are delivered by donkeys, and much of the hot bread. Their ability to glide through erratic, honking auto traffic is astonishing. Donkeys eat the green waste from the market, and the clover grown in fields lying fallow, but mostly they live on bread. Despite the competition with the Japanese and Korean mini-trucks, the number of donkeys in the city seems to be increasing. There are also a few mules and riding horses, but only in upper-class suburbs.

Donkeys, mules, horses (1980): 1-200,000

Goats and sheep are to be found in the best suburbs primarily. There they are used as lawn mowers for green areas maintained by the community and in the private clubs. A few milking goats are maintained independently to feed human infants.

Goats and sheep (1980): ~ 100,000

It is astonishing that a few dogs survive in Cairo. They slink through the shadows, feeding on throwaways and hunting rats. They are as mangy a batch of curs as can be found anywhere, always expecting cleverly aimed kicks from passersby and tortures from the most agile of the small boys.

Dogs (1980): ~ 30,000

The birds of Cairo depend upon the presence of trees, so they are to be found primarily in high-status communities beside the Nile. The pigeons and mourning doves that might nest in masonry and feast upon discarded bread before others retrieved it are themselves valued delicacies. Small colonies might exist in unusual places, but the flocks one sees in Rome or Athens are not evident in Cairo.

4. Flora. The older parts of Cairo have crowded plants out of public spaces, but they intrude when buildings tumble down. There it is possible to detect a straggling fig tree, or a grapevine, sprung from the rootstocks of an ancient garden. Everywhere else one sees unrelied paving stones, most of them very much worn, and coarse sand or debris. Not even pot-

ted plants are showing. Yet we know from reputation that the city contains a number of gem-like gardens, secluded from public view so that the women could take pleasure in them.

The European villa districts (Zamalek, Garden City, Heliopolis, parts of Dokki and Giza, Maadi, etc.) are quite well shaded, but most of the rest of Cairo is no better off than a sun-baked village. So Mrs. Sadat, the wife of the President, has taken on the task of greening the face of Cairo with trees. Neighborhoods must promise that they will attend to the transplanted saplings. The small gardens sometimes found in empty lots must put up fences to protect against theft, so there are very few except on the growing edge of the metropolis. They produce zucchini, melons, sweet corn, vine tomatoes, eggplant (aubergine), peppers, onions, and the like.

5. Habitat. Housing has become the highest priority in Egypt, since about 1975, when the reconstruction of the Suez and the reestablishment of the refugees in their original communities after the dislocations of the last Israeli-Egyptian war were pushed forward. The relief of Cairo was only temporary. Rural people keep pouring into the metropolis, attracted by the opportunity, particularly a long-shot gamble at big stakes, and the excitement of an active city. Thus there are many reports by foreign consultants on urban housing and associated services, and a wide range of proposals for new construction, some of which are being implemented.

Because of the crowding (about two persons per room average), the size of the average household in Cairo is quite high, somewhere between 5.5 and 6.0, and it is obviously highest among the poor—but not the poorest. The poor must manage to pay key money and rents upon high-valued land, while the poorest are squatting illegally, presumably temporarily, on public lands or inadequately defended private lands. The precariousness of their foothold in the city means that parts of the family may still reside in the village.

Dwelling Units (1980): 1,900,000-2,200,000

A unique feature of Cairo is its capacity to produce large amounts of housing outside of the controls of city building codes and policing systems. This informal housing was described as it existed in 1976, and those observations have been published in my *Urban Futures Observed* (New York: Pergamon, 1980). It exists today at the same scale, but the various ministries grudgingly recognize the contributions made to coping with the housing shortage and are now more willing to extend urban services. In the interim brick has become even more scarce than then, so sand brick is used to an even greater extent to fill in the walls of a reinforced concrete frame. Every Third World metropolis generates informal urban settlement, but Cairo's pattern comes closer to finished urbanization than any other. They start from the green field, rising four stories and allowing two more to be added later, thus reaching net densities of 800-1,200 persons per hectare.

6. Community Facilities. The buildings of Cairo are subdivided into *muhalle*, which are face-to-face communities and largely self-regulating. The standard community facilities found at this level of organization, which serves 5,000-30,000 people are:

- Mosque (or Coptic Church)
- Wedding/Funeral hall
- Open market for produce
- Covered commercial center with bakery
- Government goods distribution station
- People's savings bank
- Elementary school
- Social hall for cultural activities
- Cooperative for day care, etc.
- Police/fire station
- Clinic
- Government office for licenses, permissions, etc.

The younger communities have not yet acquired all of these facilities, but adding the remainder would definitely improve the quality of life. These components are often integrated around the open space in the mosque.

7. Urban Facilities. The city of Cairo is administered by an appointed governor, parallel to governors for Giza and Kalyubia. The great mosques and the opera house are in Cairo, the University of Cairo is in Giza, but Ain Shams, Al Azhar, and Helwan Universities, together with an extension of Zagazig from the Delta, are in Cairo. The elite clubs left from the colonial days are on the islands of the Nile (Cairo) or in Giza. Established originally at the edge of the city two to three generations ago, high-rise buildings are now displacing the villas that followed in their wake.

During this same period the central business area moved out of the classic bazaar focused on Khan el Khalil to an area that was no longer flooded. The highest quality cloth and shoe shops (the latter generate the most window shopping) are located on Qasr el Nil, its closest connection to the banks of the tamed river.

The international connections are maintained through embassies in Garden City (originally a Nileside community of villas, Garden City has been occupied by nonprofit, nonpartisan groups, multinational banks, and consulting offices in addition to the hotels) and the island district called Zambeek. Tourists and business groups are focussed at the rapidly increasing supply of international hotels, scattered at strategic places from the airport to the exits from bridges and the nearest cluster of pyramids.

The other new construction of a public sort, beyond the hotels and university halls, is the completion of bridges and overpasses and a telecommunications building. Condominiums keep the construction industry active, but they reflect the growth of a modern middle class, rather than the emergence of new urban institutions or functions.

8. Soils, Hydrology, and Geology. Environmentalists in Western societies have decried the "big dam" complex of the Egyptians, claiming the abolition of the annual cycle of flooding and the absence of the new layer of silt would cause the precious soils along the Nile and in the Delta to lose their fertility, and that the snails infected with schistosomiasis parasites would spread that disabling disease much further. It appears they have been wrong. Egyptians have been rising to the challenge, and they are changing their agricultural practices. As their own fertilizer is made available, more of the land will be converted to double cropping. Here, as in the United States and elsewhere in the world, there have been irrigation project development scandals (the siphons under the Suez Canal, allowing the "occupation of the Sinai with Nile water," seem to have been premature). The predictability of the water level allows many investments to be made which would have been too risky before. They can pay off rather quickly.

In the center of Cairo two long strips of valuable waterfront have been created. It is quite possible that the increase in value of this land and others nearly would equal the cost of the second Aswan Dam, a payout that very likely was not considered in the benefit/cost analyses required to launch such a project. At the moment embankments adjacent to the bridges are under construction, and three forty-story high-rise structures are under way already. This crop of governors have decided in principle that the land will not be intensively developed. That will not prevent three-tier restaurants overlooking the Nile from parklike surroundings, or intensive recreational facilities.

The soil is a fine sandy silt, raised in clouds by passing trucks and buses. The bedrock is lime with some interleaved clay and sandstone. The quarrying of the escarpment is proceeding at an astonishing clip. The city is built largely with the soil and rock upon which it rests.

9. Service Grids. For a city that survives in a desert where it rains only once or twice in a lifetime the most important public utility is water. A large part of the central part of Cairo is provided access to potable water to the building if not to the dwelling unit. It is the last 3,000,000 or so people added to the metropolis, who live in the informal housing to the north,

south, and west, that are not well served. Their women spend up to three to four hours per day queuing for water at public taps and carrying it home. Obtaining water service during the past decade has required some kind of high-level political connection, or building a mosque. A number of such communities did manage to get connected since the Census.

Meters are needed to prevent wastage, and sewers are needed to keep the traditional cess-pits from overflowing. An excellent socioeconomic study has come to hand which investigates water use when settlement was established before the extension of the grid (by Dr. Asaad Nadim of the American University in Cairo for E. S. Parsons and Co., March 1980). It was found that the cash-income level of the owners of the informal housing, who averaged L.E. 50 in 1979, was too low for the predominant majority to afford to pay for water connections, when virtually all households must participate to justify the connection.

Water is traditionally obtained in Egypt from an irrigation canal or the Nile. According to the Nadim study about one-half of one per cent still hold to this tradition. Shallow wells with hand pumps are accessible to about a third of this population, but the water has more minerals in it, so it is satisfactory for rinsing, cleaning of pots and pans, and bathing, but not for washing clothes or one's hair with soap, for cooking, or for making tea. Besides, it is susceptible to pollution from sewage. The tap water from the mains is recognized by everyone as superior, but it costs about L.E. 200 per dwelling unit to install, if everyone connects. By standard methods of financing almost half the landlords cannot afford to make this improvement. The potable water consumption before attachment to the grid runs 21-36 liters per day per capita.

The cesspits are boxes put in the ground in front of the house containing ten to fifteen cubic meters of volume. They are made of brick with concrete or steel covers. Many stand above the roadway, thus impeding the flow of vehicles. Where canals are available they are exploited as open sewers. About six percent of the units have no toilets, so the residents use the mosque, a neighbor's facilities, or the street. The oldest, densest *muhalle*, with the narrowest streets, contained most of the apartments without toilets. Overflowing cess pits drain into the streets where children play; their diarrhea and skin rashes are attributed by the people themselves (quite correctly) to this contact. Two communities with water supply but no sewer had streets which were green with sewage water, and it was not possible to pass through many streets; in others the sewers would disturb the foundations of the houses.

But the plumbers are beginning to set up shops in these communities. That is a good omen.

The electric grid precedes water. The public power company may not be very efficient at maintenance in these congested settlements, so the communities hire the electrician in their midst to repair broken wires and short circuits, with householders sharing out the expense.

The regional grid has no systemwide blackouts or brownouts, which is an indication that generating capacity was installed in advance of connecting customers. This is quite an achievement in the growth in effective demand.

Electrical Consumption

	1975	1976	1977	1978 (est.)	1980 (proj.)
Egypt(10^9 kWh)	10.4	11.5	13.5	15.0	19.0
Greater Cairo					8.0

Source: Statistical Abstracts for Egypt

In this bottom half of Cairo, deprived of water, sewers, transport, health facilities, and sometimes even of schools, eighty-four percent were connected to the electrical grid. All of these (and a few more) had radios and two-thirds obtained television (at a cost of L.E. 160, or almost the charge for water and sewerage). About fourteen percent had acquired a refrigerator,

as compared to thirty-five percent as an average for all cities. The butane distribution system already described reached thirty-six percent of these households.

The street grid is a compromise between the standard Western combination of rectangular twelve-meter streets and wider arterials and the typical Islamic pattern with six-to-eight-meter streets and building up to the property line, but interior courts and some narrow dead-end lanes. The principal crisis that is building up is that of parking, since all the pedestrian ways have been taken over.

10. Factories/Offices. The habitat for machines, people at work, and organizations larger than households will fall into these categories more than ninety percent of the time in almost any city. In Cairo the emphasis is on manufacturing, but the Government cannot seem to find a legal formula assuring international businessmen that they will be able to move their capital in and out of the country freely. Thus there is as yet very little outside capital coming in besides various kinds of foreign aid, and extremely little of it goes into manufacturing for the civilian sector. The cotton mills, steel mill, cement plants, aluminum smelter, and similar facilities are all government enterprises. Except for the steel mill and several cement products plants these enterprises operate outside of Cairo.

Physically the factories are undistinguished. They are large grey sheds. The few windows are dust-laden and almost opaque. The work places are overmanned, and much equipment is awaiting spare parts or some imported input. Yet the statistics suggest that management of the capital-intensive sector is rapidly improving.

Most of the manufacturing in Cairo is done by artisans. They do not use factories or modern workshops. Somehow with the simplest of hand tools a remarkable variety of products is produced for the modern shops as well as the stalls in the bazaar. These manufactures are produced in alleys, cul-de-sacs, and courtyards. It does not rain in Cairo, so a roof is unnecessary, but shade from the surrounding apartments and walls is helpful.

The surprising feature of Cairo is the paucity of office building. Ministries are adding new functions and bureaus to manage them but new buildings to house them are not being built, except for telecommunications. Firms need office space to respond to the demands of bureaucrats. Most offices were reconditioned villas; but now they are taking over luxury flats. This is most noticeable in downtown Cairo, where the conversion began long ago and is now almost complete. Now it is starting to occur in other districts where the telephone connections are fair and even in Heliopolis, which is almost isolated during peak periods.

11. Stationary Machines. The populations of machines in Cairo began to multiply when the connections with the Aswan Dam were completed in the early 1970s. Most of the machines are appliances. Television is the big motivator for bringing in electricity. The next item that comes is a refrigerator, now available in almost half the households of Cairo, then a washing machine.

The surprising feature is the slowness to add air conditioning, even in offices. Looking down on the city from a high point enables one to assess the frequency of room-size air conditioners (building-scale air conditioners are only put into luxury hotels). Such a survey suggests that the frequency is less than ten percent, and those already in place are quite new. Because the power supply is now relatively dependable Cairo does not have a proliferation of diesel engines to prop up essential services.

Henceforth, Cairo will begin to see electric typewriters and other office machinery, backed up by air conditioning. That was already evident when M.I.T.'s joint research group came to the Faculty of Science in Cairo University. They were in the vanguard.

12. Vehicles. The "fauna" of the mechanized urban system are the various species of vehicle; they locomote through the cityscape. Their behavior is a property of their design and the intentions of the people who manipulate them.

Bicycles are produced in Egypt, roughly at a rate of 100,000 per year, but one sees very few in Cairo. Traffic is bad and the margins of the streets are in very poor condition. Just about the time their scarcity has been explained, however, several boys come sailing by on

bicycles with pans of bread balanced on their heads! A few office couriers move about with equal bravado.

Pedal-powered three-wheeled carts of various home-made designs are seen, particularly around the old city. They are used for deliveries, bread being the most common and fresh produce next. The three-wheelers take their place in the traffic lane equivalent to a car, so their progress during congested times is much slower than the bicycles threading their way through.

Motorcycles and scooters are imported. No separate listing is given in the statistics available. Their prevalence suggests a metropolitan population of 10,000-20,000. They are best used for connecting isolated settlements with the city.

Automobiles, buses, and trucks are rapidly expanding in numbers, but there seems to be no statistical series that planners can go to in order to trace the trends. The latest figure they can cite for Greater Cairo is from 1974 (published by the local statistical agency, CAPMAS, in 1976) for a region with boundaries which greatly increased auto ownership has made obsolete. Planners are reduced to citing each other's projections. Appraising the automobile problem, this review is forced to do the same.

Cairo has the fewest automobiles per thousand residents among all major Third World metropolises.

Vehicles, including autos, buses, and trucks (1980): 250,000

Because the residential human densities are so high, Cairo is experiencing a competition for space between autos and people that is as intense as anywhere in the world.

A pedestrian-scale downtown area has been invaded by automobiles without any semblance of discipline. The cars are doubly and triply parked all over the sidewalk so the pedestrians are forced out onto the street, sharing the remaining two lanes with the moving vehicles. From 10:00 a.m. to 3:00 p.m. the traffic on the main thoroughfares moves at a rate of ten km per hour or less. Some successful attempts at rationalization have occurred, since the fifty-ton truck-trailer combinations used for moving rock, soil, cement, and iron reinforcing rods move primarily in the early morning hours and after 9:00 p.m. Yet conditions appear to be better than four or five years ago, when the city operated with sixty percent of the current vehicle population, because a number of overpasses have been finished and the bridges over the Nile reconstructed so as to increase capacity. Some of the tram lines have begun to disappear, leaving a number of light electric rail lines mostly on their own right of way to carry major flows.

Needless to say, much must be done. A few parking lots have been created where a building was demolished. They ought to be transformed into five-to-ten-floor parking garages similar to those in other congested cities, but that will require some control over illegal parking. At the moment there are not enough tow trucks to make a start.

The brands of cars form an interesting mix. From Japan it is the Mazda and the Isuzu Truck, from Korea the Hyung-dai Pong, from Germany the Mercedes and BMW, from France the Renault, from America the Chevrolet, and a few I cannot identify (where does the Galant come from?). This means that the spare parts problem is very severe. Throughout the narrow streets of Cairo one encounters the carcasses of automobiles, stripped of parts, the color virtually obscured by a thick layer of dust, staring eyeless into the *sharia* (small street) and taking up almost half the width, or rusting on the sidewalks of the luxury communities. Others which still have hopes for springing back into action are under covers, each awaiting the demise of another of its breed, so that its appurtenances can be cannibalized to allow the crippled vehicle to move again.

The bus system is approaching adequacy, being overloaded only about four hours a day. The most remarkable feature is an innovation begun only a few months ago—a minibus system, operating as a jitney. The fares are 10 piastres (14 cents) instead of four, but the minibus provides a seat. The body design is home-made; it is placed on an imported chassis for a small van. The drivers are likely to stop in the middle of traffic to let off a passenger or pick one up,

so the training and discipline is minimal. Yet everyone is appreciative. For the main corridors it is an alternative to a taxi. Undoubtedly the original fifty will be expanded to the promised five hundred before the maintenance and safety problems are faced.

13. Automata. Only at a few points has Cairo entered the automated world. The High Dam at Aswan, the Suez Canal, the airline, and the census could not operate without such systems. The universities teach the courses, and export some talented students. But there seem to be repeated troubles with software. Performance is not up to the standards set elsewhere.

This area of routine data processing and low-level decision making through cybernetic systems seems to be the principal field in which Egypt has lost by emigration of its talent to the Middle East. Almost every other country headlines its progress in this field in its western-language press, but not Egypt. So far I have encountered no one who lives part of his life in the computing world, which is also unusual for a city with many millions of people.

14. Organizations. As a metropolis develops the organizations, public, private, and cooperative, proliferate and produce a rapidly increasing share of the interaction. Organizations have greater flexibility than family firms, because they can amalgamate, split, dissolve, and spawn subsidiaries or branches (so long as there is an atmosphere of trust and an observance of law and order) without regard to biological requirements.

Organizations with up to thirty employees can still be run like a household, but beyond that middle management is needed. As foreigners buying material for a tailored suit we found ourselves being pushed off by the family firms to *Au Maison Vert*, the nearest thing to a department store Cairo has developed. This was done even by stores with English-speaking clerks. Presumably we fell outside the range of the clientele they served.

Most of the growth in organization is government-sponsored. There are special agencies engaged in construction, food processing, and family planning, to provide some examples. Independent but registered "social care societies" are expanding at about the rate of urban growth, but "multiple field" societies are expanding at twice the rate, although they are still much less numerous. Even the poorest communities contain social and cultural organizations, most of which remain unrecorded.

This year a number of activities are being taken out of the hands of the ministries and entrusted to public corporations expected to make a profit and be competitive with the private sector. The Egyptians hope they will succeed with techniques that have failed in France and Britain. The rationalization is probably an improvement, but from the attitudes expressed ("Although the firm is independent, it should be sympathetic to the needs of the Government," said a former minister) they do not have a chance to make money. The profits will be siphoned off doing political favors. Last year, for example, the government manufacturing enterprises made a sixteen-percent increase in surpluses, but used most of it up when deferring to the labor union by granting a fifteen-percent bonus.

15. Knowledge. It was noted earlier that Cairo is the chief repository of knowledge for the Arabic-speaking world. Its universities attract large numbers of foreign students. Much of this is due to a renaissance stimulated by the Napoleonic invasion one hundred eighty years ago. It was accompanied by a number of major expeditions of the French Academy of Sciences. Thereafter the Cairo elite was oriented to Paris, and its educational system took on a strong resemblance to the nineteenth-century French system. This was a major improvement, though now appearing old-fashioned. The universities in Cairo have become truly huge.

Enrollment in the Public Universities of Greater Cairo
in thousands

		1974/5	1975/6	1976/7	1977/8	1980/1 (est.)
<i>Cairo</i>	<i>Males</i>	50	58	57	59	63
	<i>Females</i>	24	29	31	33	37
<i>Ain Shams</i>	<i>Males</i>	41	47	53	55	65
	<i>Females</i>	28	30	32	31	35
<i>Al-Azhar</i>	<i>Males</i>	34	35	35	34	36
	<i>Females</i>	6	8	8	9	11
<i>Helwan</i>	<i>Males</i>	-	33	23	23	25
	<i>Females</i>	-	13	12	12	13
<i>Zagazig</i>	<i>Males</i>	9	12	21	28	40
	<i>Females</i>	3	4	5	8	15
<i>Total</i>		195	269	276	292	350

It will be noted that the participation of women is very high for the Islamic world and consistently rising, particularly in universities with the highest standards. The American University in Cairo, a private institution with a reputed 80,000 students, has an even higher proportion of women.

As in most mass institutions, the quality of instruction leaves much to be desired. It is mostly a matter of memorizing the contents of a select set of books and lecture notes. Economically privileged students often obtain off-campus tutoring, which enables them to reach standards on examinations approximating their personal potential. But the follow-up scholarship based upon libraries and book stores is limited. The society remains much closer to an oral tradition than the other side of the Mediterranean, and does not place such high priority upon literary achievement or empirical science. As a result many thousands of students are studying overseas. The families invest their hard currency hoards in them. Such students, knowing the power of the diploma in Cairo, rarely settle for less than a Ph.D. Quite a few, of course, will probably never return, but Egyptian students in America show a relatively high proportion of returners as compared to those from other societies. A large share of them redistribute through the Middle East, so Cairo loses much of its advanced intellectual leadership, mainly for lack of adequate financial support.

Since the formal transfer of knowledge in the universities has many impediments and frustrations (as many as 2,000 people are expected to attend a lecture, examinations are held only one time per year, the food in the cafeteria is bad, the Rector is threatening to flunk the least qualified students, etc.), some unrest is to be expected.

It should be expected that in any given period of time learning will be colored by a prevailing mood and what is retained and treasured will have been affected by common predispositions. In Athens, for example, the fierce attachment to democratic forms of half a dozen years ago has drifted into a feeling that more state intervention is needed in many aspects of the society—but not in the affairs of the Academia or the Polytechnic. Here in Cairo the ultranationalism of the mid-1970s has evolved toward a demand for more Muslim orthodoxy in the society. They demand that the sociopolitical system conform more closely to Koranic principles.

The man who made these observations is a serious observer with three years in Cairo behind him. The doubling of the enrollment already noted has caused the student body to be drawn from much deeper strata—down to the 70-percentile level, he says. Such young people are conservative, ambitious, and idealistic. Their ambition carries them toward secure positions in a stable bureaucratic society. Very few can understand the kinds of threats to stability uncovered by this analysis.

Thus we must expect that the universities will be a major source of instability when the subsidies can no longer be honored. Cairo could very easily produce a Sunni Muslim version of what happened in Teheran in 1979 to the Shia.

The impersonal forms of knowledge are growing to a somewhat greater degree than higher education. They take the form of lists and files useful to organizations. Nevertheless the rate relative to other large cities in the Third World is rather slow. The computer centers, which attract such information organize it, process it, and spew it out as printed reports, are not working smoothly. That is true of CAPMASS, the National Computing Centre, the university centers, and even the IBM Service Center. The governmental offices have the greatest need for such knowledge, but the private sector seems to be more aggressive in acquiring the knowhow.

V. Imports and Exports

An urban ecosystem is fed with imports. They keep it alive and allow it to grow by adding to facilities and supports. Unfortunately, the imports are counted at the boundaries of Egypt and not the edge of Greater Cairo. Moreover, the high-priority installations, such as the Suez region and the Aswan High Dam, Luxor for the tourists, the harbor at Alexandria, and the military installations on the Libyan border are not Cairo.

For example, in the categories of grain and cooking oil the countryside is relatively self-sufficient, but little more than that. Therefore Cairo's consumption must be imported from overseas. A look at the diet suggests that the average person in Cairo consumes flour from about 250 g. of wheat per day. (about 900 Calories, not all of it to humans, as explained earlier). This amounts to 90 kg/year per capita. The total requirements for people, donkeys, and chicken ranches are about 1,200,000 metric tons. The price was \$200 per ton in July 1980 delivered, and going up due to bad weather in Europe and East Africa. The quantity is about a third of Egyptian production, but an important share of the local grain goes into macaroni rather than bread. About a third of the imported wheat is received free, except for shipping charges, as Public Law 480 grants. Some donations are received from Canada and Australia. The remainder must be imported at the full world price.

The metropolis imports cooking oil, again almost to the level of country imports, so this item represents a hard currency drain. The *ful* (beans), however, are produced in the countryside, as are fruits and vegetables. Egypt is self-sufficient in sugar and rice. Thus, to generalize, Cairo depends upon the rest of the world for its staples, but on the countryside for the supplements to the basic diet.

Fuel imports have already been discussed. Since Egypt has recently become an exporter of crude oil, this is regarded as an exchange for Egypt, but for Cairo it is still an import because none of that energy is produced within the boundaries of the metropolis. A comprehensive analysis of energy is found in the joint Egypt/United States Cooperative Energy Assessment (U.S. Department of Energy, April 1979, 5 volumes). This study looks at the energy futures open to Egypt by employing a comprehensive model evolved at Brookhaven National Laboratories which balances various categories of demand against appropriate categories of supply. It is called the Reference Energy Systems Approach and is used for planning investment in energy supply, so the largest part of the effort is a wide-ranging search for energy sources followed by an estimation of their respective requirements for capital, labor, and equipment.

The principal difficulty in this study was a projection of future demand starting from 1975 estimates. The largest block of demand is Cairo itself, with thirty-five to forty percent of the total, but requirements were subdivided by sector rather than locale. No attempt was made to coordinate assumptions about population and future economic development by the groups from the respective agencies, so the projections cannot be adjusted as better data arrive. The butane data appear particularly faulty.

In 1975, they say, Egypt consumed about 7,000,000 tons of petroleum directly plus about 8.3×10^9 kWh. of electrical power. Since agriculture consumed about 900,000 tons and rather small amounts of electric power, I estimate from their numbers that Cairo imported about 4,000,000 tons of petroleum products in 1975. Its import of electric power would have been a

smaller share because the aluminum plant, consuming a third of all industrial power, is near Aswan, so my estimate is 4.2×10^9 by 1978. I doubt that the discrepancies can be reconciled without special study of plant operating histories.

Recognizing the problems, I estimate Cairo to import:

Petroleum products (1980): 7 million tons $\pm 12\%$
Electric power: 9×10^9 kWh $\pm 13\%$

In making this estimate it was noted that a strong spurt in the Egyptian import of both Machinery and Appliances and the Vehicles category beginning with 1977. It was paralleled by a major jump in cars assembled locally. The bulk of these categories would be destined for Cairo. No other sectors or categories came close in the amount of rise indicated, but announcements suggest that 1980 will see a significant jump in cement manufacture, the beginning of a tripling of capacity due to come into production soon. Cement here will use *mazout*, an industrial petroleum fuel with eight percent less fuel value per unit weight than the international standard, and natural gas, competing with coal, due to be introduced in a more efficient dry process elsewhere in the world. The availability of plentiful natural gas allows Egypt to be competitive for a while.

Water is another major input for cities. In Cairo the metered water is subsidized to an unknown degree, but half the population uses unmetered water which comes absolutely free. Women queue up at the tap up to three or four hours per day to get the household water. When the pressure in the water main failed for one densely populated precinct the women marched on the office of the responsible Ministry and beat upon their *zincas* (a twenty-liter container used for carrying water, once zinc-plated but now chromed) all day. The response was immediate. Surveys show that poor people consume twenty-one to thirty-six liters per day per person, and the remainder with meters around fifty liters. This is potable water only; it does not include water from the river, canals, or wells.

Water will become scarce in Egypt quite soon, perhaps in a decade. Then people will have to introduce drip irrigation into agriculture in order to save water for the cities. Egyptians remain prodigal in their use of water, even sending a substantial supply to the Sinai by siphon underneath the Suez Canal. The exports of Cairo are primarily services such as education, government, medical treatment, commerce, and tourism. The steel from Helwan is often insufficient for Cairo's demand, and the same may be said for cement. So the manufactured exports are primarily drawn from among the products of artisans and remain small.

Supply Shocks

A city that is dependent upon the rest of the world for essential supplies must build in a certain amount of resilience. History shows that there are major interruptions due to wars, revolutions, strikes, droughts, and financial panics which may drastically affect the life of a city.

The most specific kinds of trouble that can be foreseen would affect the flow of oil from the Middle East, about half the total flowing into world commerce. The American CIA believes this is almost certain to occur at least once in the coming decade. The remaining half would be sold at a much higher price, but distributed at least in part according to need.

Another likely eventuality is due to weather. The 1980 growing season was much too wet and cold for Europe and Siberia, and exceedingly hot and dry for East Africa. It appears that world stocks will be drawn down, but not disastrously so. A failure of the monsoon in South Asia accompanying a streak of vicious weather elsewhere could then lead to a deficit worldwide. A climatological one-two punch of this sort could devastate an unprepared metropolis by making it insupportable. There is a fair chance ($p = 0.4$ estimated for the decade 1982-92) that both kinds of disasters might coincide, so some cities might not find the fuel to operate their services and industries even if they could garner food from a dependent region..

How might Cairo survive a world fuel crisis? Almost certainly it would not get the imported butane. This means that the parallel market in domestic energy responds, almost certainly exceeding whatever the world market becomes. Given the subsidy, that means a tenfold

increase over the course of six months to a year. Special arrangements would be needed to assure that the bread would get baked. The domestic demand would spill over to kerosene, where Egyptian refineries so far meet requirements. Some electric cooking may be introduced, because the appliances would be sold cut-rate from elsewhere in the world. Electric power will be in good supply, but the subsidy required to keep the price structure (made progressive for the first time in the past year) would multiply severalfold when using strict accounting (replacement value) methods. Egypt is likely to be producing oil at the time of crisis in excess of its consumption, so cash flowing into Cairo from petroleum sales might double. No industries need shut down, although the delivery of equipment, and imported steel, from other cities would be disturbed after about six months of crisis. Thus internal shocks can be expected but they seem negotiable within precedents already established, so they are unlikely to lead to unrest.

The prospective food crisis is quite different. It is seen as two bad years following each other. A repetition of 1965-67, which occurred when world food stocks were at a peak, would leave no food for most of the 300,000,000 in population added to south and southeast Asia since that time. The first bad year causes a rundown of the reservoirs, so that a lack of recharge results in a tremendous drop in irrigated cultivation the second year. Very likely the countries which have grain surpluses (United States, Canada, Australia, Argentina) would set up an Emergency Food Board to allocate an insufficient supply. They would send grain to the places it seemed likely it would not be wasted, as has been the case in Sahel and Kampuchea for long periods of time. *Thus maintenance of public order in the face of stress is very likely a determinant for survival of great cities that secured a stock of food or a dependable source.* During a period when a twenty-percent deprivation of normal caloric intake was being experienced, India was relatively quiet. That is largely because the bureaucracy's highest priority, despite its opinionated and argumentative style, was to maintain equilibrium. Years later, after the Census was published, it could be seen that no district received less than seventy percent of normal caloric intake (because that would have caused a steep rise in infant mortality and mortality over the age of sixty)—a remarkable achievement for a society depending eighty percent on bullock carts for distribution.

Of course, climatic history does not exactly repeat itself. The next occurrence could be milder—or more severe. However the world population rise means that a crop year that caused no serious starvation ten years ago would introduce a bigger loss now, and would be disastrous if it followed a poor year.

Egyptian crops are insulated from this variability by the hydrology of the Nile and by the High Dam. Unfortunately, they no longer directly support Egypt, since the cotton must be sold at a high price to buy grain to feed the extra population.

What about the government's "food sufficiency" program? Would it not improve the ability to withstand the impact of worldwide shortage? The only descriptions available are very brief references in the English-language press. They suggest that the program is one of direct import substitution—the production of beef and chickens scientifically so as to obtain efficient conversion of imported grain and fallow land into meat. The cost in hard currency is greatly reduced, but the grain imports are increased. Nevertheless livestock does act as a buffer. In an emergency the cattle can be slaughtered and the grain they would have eaten could be doled out to people. The Egyptian cuisine has dishes which use cornmeal from maize. Thus the normal stocks in trade channels could be made to last a few weeks longer than otherwise. The insecticide and mechanization programs could also help by speeding up conversion of land to grain substitutes such as potatoes and saving more of the rice from pests. It is not as efficient a preparation against lean years as the granaries in the Pharaonic times, but the program will help somewhat if proper decisions are taken at top level.

The main problem is getting the grain for Cairo and other Egyptian cities when the price triples and other cities may have priorities for relief. Can the Government shelter the population when grain runs \$600 per ton and the P.L. 480 allotment is withdrawn?

Much depends upon achieving a flexible stance. "Flexible" in this case means a much wider range of substitutibilities and buffers so that a shortage in one commodity could cause a shift to others in easier supply. This is the economist's concept of a perfect market, and in direct opposition to the present system of declaring a new subsidy to counter each new change in cost structure. A protected public loses its ability to adapt. Egypt, unlike such countries as France or Japan, which have financial reserves to fall back on, allowing them to bid as high as necessary for the commodities that are least substitutable, has only a small basis for obtaining credit.

Food and fuel are of one piece for Cairo. If it can use less energy then there is a larger export base for petroleum and a greater capacity to bid for grain when scarce. The present subsidy system erodes this capacity, but how can a government escape from such a predicament, add to perceived welfare in the process, and thus maintain public order?

VI. An Outline for Urban Policy

One feature of Cairo has barely been alluded to, but it is essential to policymaking. It might be called the climate of opinion, or the set of common assumptions, with which the elite start their thinking. One key proposition is that Cairo is too large to be manageable, therefore it should not be allowed to grow any larger.

Automatically it follows that new cities should be founded which take on new industrial activities otherwise likely to be added to Cairo.

Another proposition universally accepted is that the city is invading the green countryside and thus building over the most fertile soil and reducing the ability to feed itself in the process. By fitting numbers to the process it can be shown that the loss is trivial, and under many conditions could be a gain, but it is a truism that is believed, even by otherwise skeptical economists.

Therefore new cities should be located in the desert. In order to make them acceptable places to live, huge subsidies must be pumped in to produce services such as water and sewers and electrical connections, along with at least core housing, all at "legal," i.e., subsidized, rents or mortgage payments. Nasser City was an extension of Cairo into the desert, but it obviously contributed to the congestion of Cairo. Since Europeans and Americans sincerely believe the propositions stated above, they have collaborated in the design and construction of new cities in the desert. I am told that the Swedes worked on the Tenth of Ramadan, the Americans on Sadat City, the Germans on the 15th of May, the Dutch on New Amerija outside of Alexandria, while the Egyptians are doing the Sixth of October themselves. Each city is a long story by itself, so this is an oversimplification.

But will people live in them? The normal mismanagement and lack of integration have occurred. The land speculators have been much more interested than settlers thus far. In their partly finished state, when the first settlers should be introduced, the cities do not have a livable appearance. Dare the new industries, particularly middle- to small-scale, start up when workers are not on hand? Since little more can be done to make them attractive enough to pull people in, perhaps something new needs to be introduced to develop a push that assures the investment is utilized. The basic proposal is intended to make the new cities more likely to be successful and at the same time to render Cairo (and Alexandria) more resilient in the face of worldwide fuel and food crises.

The basic proposal is to devise a program of about five years in duration which would reduce subsidies to a level competitive with other metropolises, such as Athens, Beirut, Baghdad, Bombay. Then the inefficient parallel markets would shrink and the economic indicators for future investment would be at least as realistic. Conditions should be created which allow multinational capital to move into Cairo—as was hoped in 1975-77 but has never transpired. The poorer countryside and new cities would retain the subsidies.

The problem is to minimize risks. Each subsidy was aimed at placating a potentially violent (or merely noisy, as in the case earlier of the women with the *zincas*) interest group.

The same people have other interests. The improvements in efficiency should be aimed at the same clientele as much as possible, so that the reduced subsidies are seen as a reasonably fair exchange.

A specific example was uncovered in the aforementioned Nadim study on metered water for the informal housing areas. There it was found that the saving in time and effort on the part of the women and girls was well worth the payment of a charge for potable water. The time could be put to use productively in studies or in crafts to overcome the cost. The authors of the study report could not imagine how to overcome the L.E. 200 installation cost when even the owner's cash income, in the bottom quartile, fell to L.E. 50 per month. But the importance of the parallel market escaped them, despite their estimates of the "key money" involved. One could negotiate a higher meter rate to pay off the installation (at full fourteen-percent interest rate), which would show up very quickly in the "key money" transfer.

In the case of butagas a similar strategy should occur. Since energy forms are technologically highly interchangeable, a common policy must be adopted for butane, kerosene, gasoline, diesel oil, and electric power. If the most economic switch is to kerosene, the kerosene cooking appliances must be ordered in advance and be visible on the market. Then on a pre-set date the price would rise. The announcement alone, with its intended effects, would cause the effective price to rise, so that when the price change came into effect the impact would be small. Moreover the increased cost of gas would be muted by a decline in excess charged for containers because their shortage would become a surplus. Thus the first step would reduce the proportion charged in the delivery process, and would reduce the capital cost of entering butane consumption. It would also suddenly make instantly available the valued "ovens" for which people now must wait three to six months. A few would go back to using kerosene. I imagine four to five steps may be necessary to bring metropolitan Cairo into equilibrium with world energy markets. The artisans making solar water heaters would suddenly have a booming business.

So far the economics of elementary textbooks has been used to describe the transition. The business people of Cairo are smarter than that. They will devise astonishing schemes to achieve local monopolies for supplies or their transport. So the government must go to the more advanced texts involving game theory. A public trading company must get daily quotations from all the local markets. When any gets out of line it must quietly sell or buy. The important feature, in this instance, is to obtain better information than any clique of private traders. If Cairo data were more dependable the game could get very complicated in the subsequent rounds, but fortunately its unreliability forces people into gambles where they stand to lose at least as much as they win.

For Cairo, Alexandria, and any other existing city to be selected for low growth, the boundaries became very important. The prospective increased cost of internal transport, due to energy price rise, would cause the outer boundary to stabilize or even retreat. Smuggling would occur, but if deliveries to the subsidized countryside were held constant the profits would be petty and difficult to aggregate. They should be ignored, because they tend to blur the actual price to customers.

The energy price transition should be accompanied by a visible improvement in the cityscape for the common man. We know from experience that fuel price is a minor deterrent to driving autos, so perhaps a measure should be introduced to favor the pedestrian against the auto. The intention is to make the city seem more efficient to most of the people.

The following suggestion is borrowed from Metro-Manila. Each sector of a public highway or street is assigned to a poor family. It is the duty of the family to clean the street or road, to keep trees and flowers alive. They may be able to share the work as a second job. They are given tickets to charge cars for parking in legal areas, say 10P; also tickets for parking on the sidewalk, initially 25P but rising. The family should wear an official metropolitan Cairo tee-shirt or other simple economical identification, to keep them from becoming too officious. All complaints are directed to the family first. Their name is posted prominently on the clock. If there is not a satisfactory reaction, it can go to the town hall. In Manila the city shares fifty

percent in the parking charges by offering both the family and the driver paying the money a chance in a monthly lottery. This keeps both parties honest. Very likely an Islamic equivalent can be invented.

Western-trained traffic engineers will start prescribing parking meters for Cairo very soon. They, however, are expensive, difficult to maintain, and still more difficult to police. This is an alternative approach that is far more efficient; moreover, because they are on daily good behavior and show, the competition between sectors naturally arises as to who is "doing the best." Such positions are best given to barely literate or illiterate families who have already spent some time in the city working at service trades. They need to be backed up by a public nursery for plants and solid waste removal system. A kiosk with a telephone could prevent a number of conflicts. Mrs. Sadat's goal of 5,000,000 new trees for Cairo could not survive unless accompanied by some social invention like this.

The principal objection to such a scheme is that some salient parts of it already exist in Cairo. There are vested interests which need to be incorporated. It is therefore easy to fall short by introducing *pro forma* elements without obtaining the positive effects of constructive competition.

A two-price system for a developing country is not unusual. Usually it is registered in the form of rents, some of which can be taxed. Most societies provide subsidies for rural and townspeople in the hope of spurring, or at least maintaining, agricultural production. The cost-of-living differential for poor families in South Korea, when it was at the Egyptian level of development (circa 1965), was threefold between town and village and primate city. About 1970 they started stimulating rural development so successfully that incomes (at the same level education or skill) caught up by 1970-80. In Malaysia also the metropolitan and rural sectors are coming back into equilibrium. Therefore the two-price economy need not be permanent, but merely a stage in the development process.

Bread Price Reform

This study has made it apparent that bread subsidies are the most pernicious. They expose Cairo, and therefore all of Egypt, to the gravest risk of upset if the world's weather turns bad. Moreover, local history reveals particular sensitivity to bread-price shocks. Finally, very little exists in the way of parallel markets. Therefore no increase in efficiency of distribution could be expected as a consequence of an increase in the price of flour and oil. Therefore none of the previous strategies may be expected to work satisfactorily.

I suspect the key has been found by the Egyptian public economists. In the *Middle East Economic Digest*, Vol. 20, 4 July, 1980 is found an interview with Dr. Ali Abdul Razzaz Abdul Maquid, Deputy Prime Minister for Financial and Economic Affairs. He claims they can raise the minimum wage from L.E. 16 to L.E. 20 (a month, I presume). They then commit a serious error by suggesting that a year later they can follow with a 0.5 piastre price rise for bread. All studies of consumption by the poor suggest that the price rise should be announced immediately upon receipt of the pay increase and take effect within a month. It is not an increase, but a readjustment to prevent waste.

A minimum price rise must be associated with a ratchet on wages in general, causing a transfer of funds from the Ministry of Supply to all the other ministries. Some sacred formulas for division of national budget may be violated in the process, so there could be cabinet resignations. This is something to be explored, although no mention of difficulties is mentioned in the analyses of the economists.

A family of five living at subsistence will consume half again as much of the staples as the average, so it will require 700 kg. per year of grain. That is \$140 on the world market or about L.E. 110. Therefore, counting related staples also subsidized, a salary increase of at least L.E. 10 per month is required for the minimum wage just to stay even. (Recall that L.E. 2-3 more was required for domestic fuel.) Therefore we are getting close to doubling the minimum cash wage in order to eliminate the most pernicious subsidies, which is a very good reason for multiple staging of price adjustments.

It can also be a very considerable incentive to move to the new cities or back to the villages. Announcement should be made, therefore, that along with the shift the parallel market called "key money" was likely to be affected, causing after a lag of a year or more some effective rent reductions for the poorest people. (Young couples report it takes four years of saving to get the key money for a minimal apartment. Perhaps in the future this and other programs could be put together to make it significantly less.) This feature perhaps is the "talking point" justifying the change in policy—deconcentrating Cairo voluntarily reduces key-money levels.

This analysis presumes that government wage structures are the best signals for wage levels in the city, and the government could legally differentiate between city jobs and country jobs by granting a "metro-bonus." It assumes that arrangements in artisans' workshops will follow very quickly, but the structure of rates and arrangements needs to be investigated. The markup formula for various kinds of shops should be considered in order to discover if any will cause embarrassment later due to conflicting regulations.

Energy Conservation for the Long Run

For each of these studies of the urban ecosystem of a Third World city a specific challenge is set. The decision processes concerning energy should be well enough understood to discover where the rapidly increasing body of knowledge concerning energy conservation can be introduced. The information digested in *Energy Abstracts*, *Nutrition Abstracts*, and similar current reports needs to be injected into the design stage for new projects for the city and the country. Too often a Third World society is being committed to a technology dependent upon petroleum when it is not necessary, or to a food-precrocessing unit that may actually reduce nutritional efficiency. If an information center is established which would be able to provide abstracts and samples of the full range of newly available information, and obtain needed reports in forty-eight hours or less by communication satellite, it could steer the investment process. The metropolis, which soaks up most of the investment, is thus steered to becoming a resource-conserving city compatible with the scarcities of the future.

In other multi-million-sized cities it was possible to pinpoint a specific site within a hundred-meter radius, which most conveniently fits the place where technological design work proceeds within the ecostructure.

For Cairo this was not possible. Who is willing to go to any trouble to save butagas at the existing price? With gasoline at sixty-seven cents per gallon (vs. \$2.90 in Athens) who needs to know which brand of automobile is efficient? When bread is so cheap, and therefore abundant in the garbage, who needs to compute an efficient mix for chicken mash? Energy waste will accelerate as long as the price signals remain as they are.

Nevertheless, an early indication of what such an information center could be like has recently been established in Cairo. The Massachusetts Institute of Technology and Cairo University have established a Development Research and Technological Planning Center in well-appointed quarters at Cairo University, funded by USAID. The Center is so new that it has only sixty-six reference books and no journals have arrived. Nor could it easily obtain printouts of technical reports from the United States and Europe in less than three months.

Once the energy price reform has begun, and its prospects can be assessed, it should be possible to discern where in Cairo the design decisions will be made that tie a technology into the local economy. Then a much more ambitious Center, similar to the DRTPC, could be located at the strategic address.

Thus redirected, Cairo could plan a future that had some chance of coming into being. Otherwise it would be increasingly vulnerable to the kinds of energy shocks reviewed here.

APPENDIX

The New Utopian Society in Islam

The future of Cairo, as well as that of most other metropolises in the Middle East, depends upon the evolution of a body of feelings among students and recent graduates that has been referred to as a "conservative mood." This trend could be explained much better than it could be described for us infidels.

The most explicit elaboration appeared in *The Middle East* No. 69, July 1980, pp. 32-3. The discussion applies to Kuwait, rather than Egypt, but Kuwait for longer than any other part of the Gulf has been subject to external influences similar to those observed in Cairo. The pressures have been less intense in Kuwait, because it has not been directly involved in the Israeli wars for more than twenty years. and there has always been sufficient money to buy off any group feeling deprived.

The preoccupation of this element in the new generation is to increase respect for certain quasi-religious standards of behavior. These include (a) constraints on dress for women, (b) a ban on alcohol, (c) adoption of the *sharia* as a basis for the legal system, and (d) more religious programs on radio and television. The leadership in Kuwait is a fraternity—the *Salafiyin*. They go further even than the five pillars of Islam, embracing the Islam of the Ancestors. They have been collecting funds for the Afghan refugees and rebels, so they are anti-Soviet even more than anti-West.

The political system they yearn for has no hereditary authority. The leader (*Caliph*) is freely chosen by the community, but selected by the *mujtahidin* (body of doctors of law). He receives a salary like everyone else. If he fails to follow the Koran he must answer before the court; if he refuses he is to be overthrown by the sword. He has an advisory council elected by the community, and ministers to execute his policy. A finance house is to collect alms (*waqfs*) and the income from natural resources, which are to be distributed among citizens. The legal alms of a rich man they assess as 2.5 percent of his fortune per year.

Their system has a judiciary, and an army containing regular soldiers and volunteers. It has governors for each city (*Wali*) appointed by the *Caliph* as advised by Muslim scholars. If the people do not like the *Wali* he is to be replaced.

Four of these Kuwaiti idealists were involved in the attack on Mecca, and only one was captured, the others becoming martyrs. Thus the demonstrations of faith can take very extreme forms.

A parallel is found in Egypt in the same issue of *The Middle East*, pp. 38-39. It describes a teaching experience conducted by Al-Azhar University, the epitome of Islamic scholarship. Prof. Muhammed Shoalan, chairman of Neuropsychiatry, orchestrated an "invasion" of a village in the Delta. Eighty specialists and students discussed medical and social development problems, especially family planning, aiming at community self-help. A month later the young leaders in the village were dismayed to discover that decisions still rested with the elders. Later a technique was evolved for a senior leader to become associated with a young discussion leader. The constructive ideas broached had been widely discussed.

The mental problems uncovered were felt to be quite serious. The mass media have introduced a strong pull toward town life and ownership of material possessions. Frustration was increasing, especially among the young, who often turn to religion and take an extreme position. They crusade against anyone having the things they could not get for themselves.

The prospects for political turbulence seem to be increasing, due to forces that seem beyond control, at a time when they can be least afforded.