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SEOUL 1974:
THE URBAN DYNAMICS OF ACCELERATED DEVELOPMENT

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By 1970 it could be ascertained that Seoul, the primate city of South Korea, for over half a decade recorded economic and demographic growth unprecedented in the history of million-size cities. Moreover, the development appeared to be at least as balanced as any other, since health, education, social welfare, and related indices poorly represented in gross domestic product accounts showed marked improvement.¹ The metropolis of Seoul was likened to a developmental engine pulling the remainder of the society, the part that had not moved to the capital city itself, after it. Seoul was rushing toward modern social conditions at a breakneck pace.

Development planners since World War II tried to induce this kind of progress in poor societies with low levels of resource endowment, but never imagined that the rates of transformation could reach such a frantic pitch. Would the future reveal some serious imperfection? Perhaps show some weakness like that of a turbine spinning under unprecedented loads? Gradually flaws expand at critical points in the design, the turbine begins to wobble, building up the stresses still further, and it must soon be shut down for repair.

The Seoul of 1974 is still developing as rapidly as before, but the consequences are distributed over the country by a kind of centrifugal force. Its population growth rate dropped from the neighborhood of 10% per year to less than 3% per year, in part because

¹Richard L. Meier, "Seoul 1974; The Urban Dynamics of Accelerated Development", unpublished work, 1974.

one no longer must get into the metropolis itself to feel the tug of the vortex. Through an expanding network of roads, telecommunications, schools, and improved rail lines, whatever is Seoul's becomes the nation's; it is now accessible within a day for well over 95% of the people living within the peninsula and the islands.

Over the past year or so, Seoul has become conscious of its environment. The great reduction in the flow of immigrants enables people, and the government, to catch up with housing needs, converting shacks that provided minimal shelter into substantial cottages for members of a stable working class. Meanwhile, the water lines were extended, crude sewers were installed, paving tiles were laid down over them, and patches of land filled with rubble have been landscaped. Seoul's ornamental horticulture is not in the same league with other metropolises its size, but it is learning to take pride in its appearance the way a rangy tom boy discovers she is a woman, fully-fleshed and potentially as presentable as any. Tentative touches added here and there, some of them quite amateurish, amount to real progress in beautification. (Only one full-fledged landscape architect was found in the city, or the country at large. When the policy change became effective in 1972, and only two or three persons had some training.) The most outstanding improvement in the environment of Seoul has come through a settling of the dust in the central areas and the main corridors, where it had been produced by a combination of construction, traffic over unsurfaced roads, and lack of street cleaning. Developed countries have forgotten about the effects of dust and mud upon the quality of life--dirt is a much more immediate distraction than water pollution, litter, and destruction of wildlife. The latter are the issues that dominate the attention

of civil servants and independent professionals in Korea as well as in the rest of Asia.

Despite the record-breaking rate of improvement in many different directions, South Korea and its capital city have a bad image in the international press. From the reporters of the Far Eastern Economic Review come a series of brief pieces about problems of industrialization and finance faced by government and business. They adopt a tone resembling that employed for diagnosis of the sicker economies of Asia and the Far East, yet when the economic statistics are published together, South Korea stands at, or very near, the top of the class. The New York Times has depended heavily upon its Tokyo office and upon Tufts Professor Gregory Henderson, who wrote an excellent political history of Korea but now is engaged in an open feud with the Park administration. Western European countries are nauseated by the strong anti-Communist line taken by the government at a time when the detente is the hope of the future.

From the strict midnight curfew to the shielding of the public from overseas criticism and the repression of the university intellectuals, one encounters all the apparatus of the military state. In these features Korea is quite similar to the Phillipines, Indonesia, Taiwan, Thailand (most of the time), South Viet Nam, Cambodia, Pakistan and Burma. Controls are much stronger, of course, in North Korea, North Viet Nam, Mongolia, and Siberia. China achieves the same ends with less visible military control. For this part of the world, Korea remains one of the most open societies, but its freedoms are noticeably contracting rather than expanding. That trend may be the basic cause for the bad press--everyone assumes that political development and freedom of expression should progress as rapidly as the economy, but

in Korea they have not done so.

The excuse given by the Government is that there is an immediate threat from north of the border. It claims that there have been elaborate attempts at subversion. June, the month in which first-hand observations were made, happens to contain the anniversary of the first invasion, now twenty-four years back, but still seared in the memory of the officers who in the interim have become generals and colonels. June is also the period for increasingly prolonged rehearsal of accounts of the specifics for the attacks that have occurred since the cease-fire twenty-one years ago. The manic repetitiveness of the propaganda, and the shrillness of the speeches over television, suggested group paranoia. The way in which the messages were transmitted induced disbelief in the interpretation handed out by officials. This judgment was reinforced by the conviction of two university staff members, together with that of a student, for "spying" and incitement of the masses to protest actions of the Government. Then suddenly a patrol boat was shelled and sunk far off shore, with twenty-nine lives lost. Exactly this kind of provocative action, celebrating the anniversary of the war, was forecast by the South Korean Government based upon its intelligence from the North.

Perhaps this incident changes the interpretation. Instead of paranoia, the leadership may in its direct and bumbling way be trying to alert an increasingly affluent and complacent society to the recognition of a real threat to its existence. (Or was it a staged incident intended to keep American troops in Korea at a time when the U.S. Department of Defense planned to pull them back? If so, the event should have been timed a few months earlier.) A fair assessment of national politics in Seoul would probably conclude that

an edgy leader, surrounded increasingly by yes-men and dependent upon the Korean CIA, tends to cause over-reaction to threatening gestures and statements from the outside, forgetting about the considerable dangers of escalation of threat in a deadly contest.

The restrictions upon the civil liberties make many features of a survey of Seoul's developmental impact impossible at this time. The best that can be done is to seize opportunities, making several probes at considerable depth by taking advantage of openings available to an outsider at the moment. For Seoul this is a period of institution building--the addition of an ever-widening range of social and economic capabilities based upon social learning mechanisms--so the analysis of published statistics provides only a superficial guide to understanding the current and future impact of its growth.

It is apparent that Seoul will continue to be precocious among metropolises. It will generate surprisingly rapid development of certain facets or specialties, where it will jump from nothing at all to the top of the division of the major leagues in world competition in a short period of five years. That is the heritage from its extraordinary past growth. But increasingly it is a primate city acting in close concert with the hierarchy of urban places it dominates, so that the actual address of the physical achievement in institution-building may be elsewhere, sometimes hundreds of kilometers away.

What follows are the independent probes, based upon field notes from four weeks of investigation, of present circumstances and trends in an attempt to get ahead of the published statistics. They provide a sample of expectations for the future.

The Other Metropolises: Pusan, Daegu, Kwangju, and Daejeon

At the present time in Korea, only the urban aggregations amounting to a half-million or more in population qualify as metropolises in the international meaning of the term. Smaller urban centers are regarded as ordinary cities with about one to three specialties contributing to the national economy. Before the huge distress flows of refugees began to stream into the newly liberated urbanized areas in the 1950's, all four of these were considered to be major provincial towns. The cities that evolved were swamped in the 1960's by an opportunity-oriented influx, so that they were virtually surrounded and totally infiltrated by squatter families. The overgrown cities have now transformed themselves into multi-functional metropolises. By 1974 the squatter settlers had either rebuilt their dwellings, creating a respectable urban neighborhood, or they were displaced by central authority, which assigned the land to higher valued uses. Meanwhile, at a distance from the respective centers, new higher standard settlements were initiated. Therefore, these four metropolises graduated to the status quite recently, each of them giving promise of taking on an individualized shape and function.

All of South Korea contains about thirty million persons -- nearly the same as the number of Americans living west of the Rockies, except that the area of the Korean peninsula that they occupy amounts to a bit more than a third of the size of California, with about the same proportion of the land taken up with mountains, flood plain, and steep slope as is found in California. However, Korea supports only about 2-3% of the automotive vehicles that would be maintained by an

equal number of Western Americans, therefore the territory is not as crowded as might otherwise be expected.

Moreover, since people sit on mats, stools, low benches, or literally on their heels while at home, and fold up their beds to release daytime floor space, Koreans need only about a quarter of the enclosed living space that Americans routinely exploit (but Koreans do not yet have all the dwelling space they feel they need in the long run). Therefore a million city people in Korea, along with their vehicles and their pets, require only about a tenth as much land as the same number of Americans, but so far they have settled upon an even smaller proportion.

The study of these metropolises is important because policy will soon be made to determine whether Seoul should be consciously expanded beyond the six-and-a-half million that it now contains, or whether the other metropolises can absorb the surplus better. More significant, however, is the choice of specializations with the nation and the world. Are the other metropolises still pale, diminutive shadows following Seoul, or are they already representative of independent forces? Large questions like these do not get answers when they are asked of individuals (local people know too many details and are unable to summate them to formulate a conclusion they would trust at all). A quick visit to make observations would exclude most theoretical possibilities and allow the investigator to focus his attention, using statistics as a guide, on the few alternative answers that remain open.

Pusan has been designated a "Special City", an arrangement that gives it a position in the Cabinet nominally equal to Seoul, and--

along with this status--a budget separate from the province that surrounds it. Therefore its appeals for funds have one less layer of administration separating it from legitimate sources of cash. Korea spends most of its national monies in Pusan for harbor facilities, industrial estates, power plants, and water supplies, with virtually none of it allocated to highly visible urban structures.

Civil servants and residents in Pusan suffer from a severe case of "second city" status complex. None of the thousands of Koreans who studied overseas and then sought jobs in Korean government have appeared as yet in its administrative hierarchy ("They are all in Seoul"). Only a handful, outside of medicine and related areas of science, are found even in its National University. Perhaps as a result, the city's bureaucrats are energetic, empirical, pragmatic, and not at all addicted to the romantic nonsense that results in monuments and spectacles.

Pusan is basically a city of workingmen, seamen and small shopkeepers. Its 2,100,000 people sprawl across the hills and flanks of mountains; the residences and facilities for lesser commerce displace terraced rice paddy which had been pushing up into the brush ever higher on the hillsides. Squatters occupied slopes upon which no rice would grow, but they too gave way. Heavy industry, railways, and highways string out through the narrow valley floors. The harbor, a small, deeply dredged inlet protected from gales by a one-mountain island, seems to be the focus of all productive activity. Over the ridges, or through short tunnels, in the neighboring small watersheds, are some higher class settlements, many of which are still very much under construction.

Some of Pusan's squatter settlements look as noisome and untidy as any in the world, but they have been condemned, and were scheduled for destruction months earlier. However, a hitch was encountered in providing land for re-settlement and self-help housing. So the people were asked to remove themselves and find places in the vicinity to wait a few months--enough time for the bureaucrats to straighten out matters. Their protests about such treatment reached Seoul; as a result of non-party political mobilization the day the bulldozer leveled the community was delayed.

Starting in 1968 the Pusan mayor (an appointive office for a general) decreed that new settlers coming to the city, along with those displaced by urban redevelopment who did not have capital to invest in housing, were to be banished to a distant valley. Because these poor people were badly served by buses, and sometimes ran short of water, this policy caused a considerable amount of hardship. Nevertheless the crises were tended to before the settlers gave up in disgust, and a stable working class community based upon familial self-help has been launched that is still attracting many new households. Belatedly the bus route leading to the factories and to the city has been asphalted, so that the pall of dust has been greatly reduced. And a full complement of shops has now been installed on several pedestrian strips and along the bus route through the settlement. Life is definitely better there than the alternative of living virtually landless in a village. Women can get jobs in knitting mills, garment or shoe factories directly serving the export market. If a family has several workers in it, the household unit can live simply and save significant amounts of money rather rapidly.

A more respectable and face-saving policy for housing immigrants and squatters was started in 1972, as a result of public objections to a program that set up four to five story apartments close to the center. Tales about the collapse of reinforced concrete structures were all too frequent. (Even the building designed to house the cement manufacturers' trade association, which was to be a showpiece for Pusan, had to be abandoned due to uneven settling into reclaimed land; it still stands as a silent mildewed warning that these approaches to design are too risky in Pusan's precincts.) Therefore exceedingly dense tracts of one-story houses, each containing two 1-DK apartments (40 m² internal dimensions), stucco walls, framed windows, colored tile roofs (but thin and likely to fade over time), and surrounding walls of rough grey brick made with granite sand, all of which gave them greater class than walk-up apartments.

At eighty dwelling units to the acre (two hundred to the hectare), including the pedestrian circulation space and the tot lots, the concentration of people approaches that of the highest in the Hong Kong blocks. Yet the steep green slopes surrounding the tract, except for the way out (which was asphalted from the start, so that dust is a minor problem) alleviate the feeling of crowding. Here the city government of Pusan offers any family unit with the capacity to acquire \$2500 in capital a chance to live in what is considered to be a modern house in Korea. If the family becomes prosperous, it can buy the other half and obtain twice the amount of room in addition to the extra privacy--a process already under way.

The next plans for housing are expected to be noticeably more ambitious. So far unrevealed, the Special City intends to put dwellings on a central hillside this year after it displaces the squatters. The

trickle-down of public funds obtained from economic growth in Korea occurs quite rapidly in Pusan. It is only one or two years behind Seoul in upgrading or abolishing the most degrading living conditions.

Daegu, the third largest metropolis, is not "Special" but is still privileged because it is the capital of the province from which the family of President Park comes. Built on a medium high plain and surrounded by imposing mountains, Daegu's growth is limited by an undependable water supply. Assigning a levelling-off population of one and a half million, the city has already accumulated 1,200,000. Recently added industry is not very capital-intensive or skilled, so it offers rather low-paying jobs. New industry is already being shunted to satellite centers above and below. Daegu is close enough to full employment to have reduced the number of street vendors and hawkers to a level where they do not seriously compete with established businesses. A large central market displays a huge variety of the light manufactures, along with similar goods from elsewhere. Almost all are intended for household and agricultural use.

Being favored by President Park's ministers means that a little bit of civic enterprise pays off. The parks of Daegu are well landscaped, the rail terminal is new, clean, and airy, as well as being closely integrated with the cross-country buses. Housing of all types is offered by the local authorities. The sewers drain well, and the local buses are kept in repair so well that none of them belches black smoke, even when going up a slope.

We asked to look at the bargain apartments offered by the city. Four-story 2DK walk-ups conveniently located, excellent view, best schools, cost \$5000 finished quite beautifully for 50 m² of living

space. Over-subscribed twenty to one, these were disposed of by lottery. Nevertheless the preference of most people in Daegu was similar to the American; they wanted single-story, free standing, traditional houses. In Daegu, brightly colored tile roofs (chung, green or blue, had the highest status, but a Buddhist orange or a cherry red indicated a strong independent personality) were universal in the newly built areas. The plot sizes were 60-130 m², and the streets were broad enough to accomodate one-way auto traffic. As a result the new building was using up a lot of land on the "wrong" side of the city, according to the published plan. However the city planners quickly adapted to the market decisions of the people who could afford housing, and promptly provided a convenient city bus terminal that served the settlers on that part of a periphery. Its presence doubles or trebles land value within 500 m, so there may have been incentives from specific land-owners. A collusion like this is not ordinarily scandalous in Asia.

The green mountainsides are major assets in Daegu's portfolio. They suffered gravely during the Korean War. The pine forests on their slopes were destroyed first by American bombs, which the Koreans gratefully admit stopped the advance of the invaders on the north and east, that being the point of furthest penetration. Then the forests were shelled and burned even more oompletely when it became necessary to root out snipers and guerillas holed up in heavily wooded areas. In order to avert erosion, the slopes were allowed to develop hardwoods and brush, which keeps them green or yellow from May to November.

In Daegu's future is a belt parkway that encircles the city about a hundred meters above the plain at the top of the talus slope now covered with thin forest. It could be a very pleasant "green-belt." My suggestion that it should be devoted to the cycle mode of

traffic, for which the mild grades are well fitted, was not appreciated as yet, even in a city where regional science has come into its own. (The City, together with the major regional bank, publishes a journal in Korean that is filled with contributions from its own universities, departments and banks.) Being data-oriented, the future they see is extrapolated from a recent past of buses and taxis, which make the life of a bicyclist very hazardous. The bicycle user one sees in the city is barely one step up the social ladder from a coolie, but this is just now beginning to change among the youths presently in high school and college. They are finding the terrain of Daegu well-suited to the newest export quality bicycle, although not to the extent that is found in Seoul, where hills limit the range of the bicycle much more. The regional scientists obviously belong to an older generation.

Universities in Daegu are almost extravagantly housed, as are parts of the city and provincial governments. When the city builds up a more distinct and unique visual image it should be able to generate an even stronger regional loyalty. Ties of that kind would keep many of the most energetic people at home, preventing their drift to Seoul. In that way its reputation might be analogous to that of Denver (to which it bears many resemblances), where residents and most visitors believe Chicago, New York, and Washington to be inferior choices as places to live and raise children.

Kwanju, on the other hand, is the center of the political opposition. Situated in a similar valley bowl to the southwest, it is poorer, dustier, less developed, and only just now taking form. The population is half that of Daegu, and its main industries are similar, except for a two-year old Fiat plant assembling buses, vans

and cars. This regional capital is surrounded by the rice bowl of Korea, which in turn is edged by settlements of fishermen insulated from civilization by rocky tracks and a tidal range that hinders regularly scheduled marine connections. The fisher people tend to be the poorest in Korea, and also the most difficult to help.

Yet Kwangju may actually come out ahead in the long run due to the retardation of its development to date. It has more water than the other large cities, and more uncommitted space. The completion of the toll road loop to Pusan was made only last year, and the terminals for the buses plying those roads opened only in the spring of 1974. Suddenly, instead of a jarring, choking, seven or eight hours, it is only 220 minutes by smooth ride to either Seoul or Pusan. Inside the city itself an asphaltting machine is working almost full time on the main streets and alleys.

The citizen leaders of Kwangju are alert, cooperative, and independent. The potential supply of labor still in the rice fields is relatively quite large. Thus Kwangju has now become an ideal location for some of the most modern large industries which locate in Korea over the next few years. It is no surprise that the word has gone out among the circles of knowledgeable men with uncommitted capital in Seoul--"Buy land in Kwangju." But the planners report that the price of land has already gone so far out of line that the laying down of the essential infrastructure has become unreasonably expensive.

Some of Korea's best coal mines are in the vicinity of Kwangju, so it has suffered less than others from the energy crisis. Most of the coal goes into ondol briquettes, used for home heating and cooking, ending up in a form of solid waste in Korean cities that is unique.

The coal is powdered and mixed with clay (kaolin) and formed into cylinders about 20 cm. in diameter and the same height. Flue holes are molded in parallel to the axis so that the briquettes can be lined up. Two of them in a bucket-like container will produce a very satisfactory, long-lasting cooking fire with the ash of the coal left incorporated in the clay. Thus a reddish gray, sometimes black-streaked cylinder is left to be disposed of as waste. It can be laid down to prevent erosion in small streams, or even be built up into a back wall, but at present is usually dumped into low spaces as fill for land development. Since the coal deposits will not last long, a substitute for the ondol must be installed on a large scale in Korea starting a few years from now. Its proximity to the mines would suggest that Kwangju would be the last to change, but the fact that it has the greater part of its building ahead of it may cause the innovation to be adopted completely there well before the others. Indeed, one of the first inventors of an ondol substitute lives in Kwangju.

The center of Kwangju is remarkable in that it has no tall buildings and none are in construction. Its tourist hotel stands out with its four floors. An artist's conception of the future city maintains this earthbound quality, allowing no more than six-story blocks. Away from the city, overlooking the plain and nestled in a dimple in the mountain wall, is the private university with a high-gable, almost Gothic, architectural form that rises higher, obviously disassociating itself from the ordinariness of the incipient metropolis.

A broad river, narrowed within the city by encroaching perpendicular embankments, runs through the center of Kwangju. The river does not add to the appearance of the central district however because a new dam in the mountains holds back the water except toward the

end of the rainy season. Thus for eleven months of the year the citizens see a jumble of rocks and sand banks with a dribble of water running through--no trees, no green banks, no gracefully arched bridges. A pedestrian shopping mall runs for two kilometers adjacent to the river; its helter-skelter distribution of shops and services stubbornly resists the attempts of the planners to group them by zoning techniques. Given the physical attributes and the economic realities, it will be extraordinarily difficult to create a central district of which one could be proud. Most likely the parks and estates will be distributed on the periphery of the city, probably fitting a more cosmopolitan taste that is contrived elsewhere, because the location and image in those places will have been established earlier.

A bit of old Kwangju suggests part of the future in this peripheral development. Two textile mills were started side by side in Japanese times, and built up into park-like compounds. Many employees and the top management have dormitory rooms or homes inside the gates. There is a club, swimming pool, and tennis courts. The girls go there to help pay for setting up a household; their families come to visit and are impressed by the park. Thus, it would not be surprising to encounter a Korean "country club style of living" that evolves particularly in Kwangju, especially if the residents have a common role that consolidates and facilitates community feelings. Government service, industrial estate employment, or Christian church membership might be able to produce enough extra cohesion between people to make this outcome feasible. The implications for Korea are, of course, different than for America. Thus far, it must be admitted, the small tracts of new housing going up do not reveal any neighbor-

hood recreational facilities, even though the idea seems feasible already.

There are only 10,000 university students in Kwangju attending the two institutions. The remainder (perhaps half) are in Seoul. None of their study halls or libraries is either heated or air conditioned, so the U.S. Cultural Center, established in a reconditioned Japanese colonial residence that provides both, is highly popular. Happily, it has a high capacity. The emphasis in the book collection seems to be on the subjects that do not require important amounts of laboratory work--economics, social sciences, law, pre-medical, history, classical arts, and languages.

The World Bank and the United Nations Development Program together have taken an interest in Kwangju and its region. The new toll road and the express buses were backed by the World Bank. The UNDP is evolving a physical plan (not quite finished) which will program the laying down of the advanced infrastructure--new reservoirs, roads, industrial estates, electric power grids, telephone systems (the city is almost cut off due to overload of long line circuits induced because it is not on the high capacity main trunks connecting Seoul with Pusan), sanitation (solid waste is one of the city administrator's worst headaches in Korea), secondary education and recreation.

Now the World Bank is interested in starting up two or more "site and services" approaches to low cost self-help housing. Kwangju provides a site for such projects which almost guarantees success. All the known reasons for previous failures have already been dealt with by national or local authorities. Those of us who know how hard it is to succeed in the provision of low cost housing feel that the World Bank needs a few easy successes to expedite its urban programs.

Daejeon (or Taejon) is located at the inverted Y in the toll roads leading south from Seoul, and a similar split in the rail line. It is the most central urban area in South Korea, based upon present population distribution. As urbanization proceeds into the future, this centrality should remain. Thus Daejeon is a natural location for nation-serving activities that are relatively independent of day-to-day government or international dealing. Therefore it contains sites appropriate for manufacturing products for Korean consumption and for distribution-related activities. A warehouse for pharmaceuticals, or for textbooks in schools, would find Daejeon the most economical location from the point of view of minimizing the overhead costs of keeping in stock as well as the lesser cost of delivery.

We went through this metropolis of a half-million people without staying overnight, once on the train and again by bus, thus getting two different perspectives on the layout of the urban area. The land is quite low, with rolling hills in the distance. Industry and warehousing are scattered about; a few attempts at Korean sophistication are islets in an archipelago of mediocrity set upon a background of market gardens. Ragged quonset shapes covered with polyethylene to force the vegetables into early production appear along with tobacco plots and paddy fields.

The latest moves to Daejeon to be discussed are those which will result in a "science city" to be located on the Seoul side of the presently urbanized area. It is scheduled to have nineteen research institutes and special facilities. The master plan is now being drawn up while scientists lobby against the idea, primarily because they see reduced prospects for lucrative consulting around the Capital city.

Since Daejeon is also on the communications trunk line, project and program leaders in the institutes will be able to consult many experts around the country within minutes, and bring almost any specialist within two hours. The leading Korean university, Seoul National, is being relocated next year to a small valley outside the old city walls on the road to Daejeon, so its professors will find Daejeon little more inconvenient than consulting for the ministries in Government Center. Therefore, if a "Science City" works at all, it should function best in the vicinity of Daejeon. The improved transport and communications are converting the Daejeon region into an outer satellite of Seoul.

The program for the construction of the institutes reflects the current set of national priorities. The first to be set up is the Marine Transport Research Institute, intended to facilitate the Korean ambition to become a leading shipbuilder in the world. Immediately following its completion, the Institute for Ocean Science and Technology, dedicated to using the resources of the high seas and the continental shelves, should also be ready. This is part of the national strategy for providing alternative sources of livelihood for the poorest heads of households in Korea--the fishermen. Immediately thereafter will follow institutes for micro-electronics, circuitry and machine design. And later will come such things as industrial micro-biology (fermentation) and food technology. These research institutes are thought of as equivalent to the research associations in the United Kingdom, but will also reinforce each other as the complex expands. The major problem will be keeping the wives happy, because they feel separation from Seoul much more. Few of the scientists and engineers in Korea can expect to be able to afford a private

car in the near future, unless they also use it for their work (in which case the wives are still isolated). The one thing that may be forgotten in the creation of a "Science City" is that Korea should have an increasing number of foreigners in residence, so that the housing and urban services must fit people with cosmopolitan tastes and life styles as well as the Korean, yet both must live economically.

Daejeon may therefore be the place to introduce advanced dial-a-ride systems and networks of bicycle lanes for passenger transport, extra variety in housing types, bilingual schools, an all-year swimming pool attached to the bath house, and similar features. Centers for musical, artistic, and cinemagraphic circles would also help reduce loneliness. This is far more complicated than the usual assignment for planners--that of determining appropriate sizes for house lots and apartments.

II. SEARCHING FOR SEOUL'S SQUATTER HOUSES

In earlier days it took a lot of scrounging to stay alive in Seoul. The houses of the poor demonstrated what kinds of opportunities existed and revealed the indigenous enterprise for assembling some kind of protection from the elements. In 1968 and 1970 it was possible to see from the buses on many of the roads out of the city the heaps of scrap lumber, tar paper, tin sheet, tile, bricks, and unframed glass panes that made up a good fraction of the previously built self-help houses. Narrow lanes were choked with unused gleanings from the city along with the produce brought in to fill the daily pots and the splattering muck that lay over the ground. A bicycle was a prize; it was used to carry shipments up to 200 kg., but an A-frame pack rack by which a small man could carry 50 kg. was the standard conveyance. Even then, however, one could find a scattering of houses that were stucco-finished, white-washed, clean swept, drained, and topped by a carefully caulked tile roof with a short chimney that gave adequate draft but kept out the rain. Such a house communicated to the neighbors the aim of rising above them and achieving a full set of the relevant symbols of middle-class respectability. Most of these houses were built at the base of the hills of weathering granite which had a speckled white appearance when newly fractured, became pink after a season or two, and finally turned rust red when aged a lifetime, so it is easy to identify the rough age of the assaults upon the bedrock undertaken for the purpose of terracing or path improvement.

These same granite hills provided the buttresses for the city walls of Seoul. The Korean equivalent of burgers lived inside, while country people straggled along the outside roads in their round-topped thatched houses. There were always stories of exiled intellectuals and "radicals" who left the security of the inner precincts to live among the people. Their presence might have explained--directly, or indirectly through imitation--the instances of urbanity among the squatter settlers of the previous decade. But now everyone is reaching for those levels of respectability and almost all are within a few steps of achieving it. Areas with the reputation of being the worst in the 1960's were sought out and visited to see if they would yield some clue to the transition.

Ogsudong is such a community on the "country side" of a granite outcrop adjacent to the road leading to the third Han River bridge. The proper urban side has forest, official buildings, blocks of mansions, and a few lesser embassies. The impression one gets from the minor road leading into it is dominated by a series of workshops handling dirty, heavy materials with simple machinery but interspersed with small retail shops catering to the working people. Rising behind, treeless, are thousands of cottages, irregularly spaced. At the edge, next to a small cleared space that retains traces of puny shacks now vanished, are newly raised stonewalled terraces supporting rich men's houses, landscaped with flowers, shrubs, and four young trees for each mini-estate. More are under construction. Are the moneyed people displacing the original settlers of Ogsudong?

My wife and I started our walking tour by heading for a prized south-west facing slope upon which vegetables are again grown. The night soil of the settlement was liberally administered upon the

radishes, lettuce, peas, turnips, beans, and melons. Women and older girls were tending the plots, while small girls were cutting greens out of the tiny patches of wasteland. There were none of the prized black goats, no pigs, and very few dogs; only one clutch of chickens was noted. These last observations suggested that, though the gardens smelled and looked very much like a village, the patterns of cropping had urbanized.

All the houses adjacent to the garden plots were complete, but only a very few had become workshops. The latter were engaged in making cheap household furniture from the lumber and plywood manufactured in the tiny mills on the road below. The principal building material was a cast building block that used cement as its main ingredient to bind the sand from the weathering of the hill. A handful of well-built wooden houses left from the period preceding the squatter invasion are now adapted to storing produce from the gardens--an indication that the pressure for living space on the part of the migrants has been greatly reduced.

The lanes of Ogsudong are freshly brushed and cleared of litter. Some solid waste had been used to inhibit the gullying of the garden slope (mostly clay cores remaining after the briquette had been burned in an ondol) but industrial waste was not really evident, nor were there any bottles or plastic containers lying about. Wrappings from candy and bakery goods were the prime source of litter; the detritus from fruit and vegetables was usually a minor contributor. Rusted tin cans were rare. What this means is that very likely community effort must have been undertaken in the spring after the snows disappeared and the original discipline has been maintained.

Under the lanes are sewer pipes laid in troughs dug out of the rock and covered again. They are used for waste water and storm drains, and not for sanitary purposes; indeed, in the small streams and channels down below, one finds remarkably clean and sweet-smelling water. Pollution at this time of the year came from the concrete blockmaking plants which dispose of sand and lime dust through washing with stream water. No oil films or anaerobic sumps were found while poking around the improvised drainage system. On three instances sewer pipe breaks were noted that had not yet been mended, but they did not cause inconvenience. One was forced to conclude that an extremely rational and quite adequate sanitation and sewerage had been improvised to cope with a site which only the rich could afford to occupy and make it conform to international standards.

As with most Asian poor, the residents of Ogsudong are served by water carriers. At the top of the rock we saw a standpipe delivering a stream that filled a well-designed 20 liter container in less than two minutes. That rate of flow means a high rate of productivity for the water carriers, since there is little waiting at the source. It also means that there must have been some effective political pressure, because water flows freely at the top of a hill only after considerable public investment. There seems to be different back-pack specialists who carry fuel from the three-wheel lorries on the road up to the tiny shops that serve as distributors. Again there are probably other coolie type roles for the collection and sale of the night soil. Wherever possible he would use the standard two-wheel cart frame with wire wheels and heavy bicycle tires that is equipped with a 200 liter green tank and pushed or pulled around the lesser slopes, while still another specialist would use the same

cart frame fitted with boxes to collect the rubbish in the early morning hours. Thus even a poor urban settlement has put together a complement of urban services that keep it clean and livable, although none of them employs techniques resembling those evolved in the West.

The real scenery is the children. They are well-dressed, well-fed, lively, agile, curious and communicative. One indicator of unhealthy environment is the frequency of skin infections visible on arms and face. For example, in Tokyo of 1950-1951, a well-established settlement built upon slighter slopes, but with open sewers and not so well organized waste disposal, exhibited a significant frequency of hookworm and related infections.² By 1966, after the sewers had been covered, night soil collection had been systematized, and health services extended to cover everyone, only a few cases were evident.³ Ogsudong conditions in 1974 appear to be healthier than this Tokyo community in 1966, even though the Koreans are more primitively equipped.

The children will follow a visitor with a camera all the way to the edge of their "turf", which for ten-year old girls and younger boys is a surprising kilometer of crooked lanes and weaving narrow streets. Few other societies allow their young children to stray that far from home. Living on the rock with sheer cliffs, eroded steps, narrow ledges, and tiny terraces, the children become sure-footed at age two or three (all are well-shod with the kind of rubber-soled shoes that one can step into with arms full; only a few infants were barefoot). They race around the open spaces in a startling

²Ronald P. Dore, City Life in Japan, (Berkeley: University of California Press, 1958.)

³Richard L. Meier and Ikumi Hoshino, "Adjustments to Metropolitan Growth in an Inner Tokyo Ward," AIP Journal (July 1968), p. 210.

fashion. Railings are infrequent, and where they exist they are primarily of assistance to the grandmothers with backs bent like question marks from carrying many children in the Korean fashion and later being unable to carry heavy loads on the head.

On a sheet of granite facing north stand a dozen examples of the Seoul city government's first alternative to squatter settlement. They are five-story flats (sometimes a sixth and even a seventh on the downslope side), with one family to a room plus a toilet and a tiny balcony. Land and construction costs were packaged and paid for by the occupants over a ten-year period, while the finishing of the apartments was left to the families to finance and build. Now, three to five years after moving in, some of the balconies are enclosed, while others are piled high with brown-glazed pottery jars of various sizes that exude an odor like kim-chi, despite their weighted lids. Tuesday's wash is out but seems to be made up of children's clothing only; it puts more color in the scene than the symmetrical red brick flashings on the piers that ascend to the top floor and the faded green paint on the wood-framed windows. Perhaps a quarter of the windows protected the residents from upper-story prowlers, most likely to guard a television set. The clutter was astonishingly small for working class apartments; no junk at all was in sight. Although the halls are quite dark and narrow, housewives still stood in them and gossiped. Bottom floors of the lower buildings were dedicated to shops, but no manufacturing artisans were present.

The nearest sources of employment are down a hundred to two-hundred steps carved in the erodable rock and then along the streets served by buses and big lorries. Peckerwood sawmills with small drying yards neatly subdivides huge logs hauled in from Borneo into

thin gauge lumber, panels, dowels, and some plywood. Black-faced workmen overhauled Diesel engines, but they took pains to keep the oil and grease from entering the sewer in all but the rainiest periods. Tailors and other artisan shops hiring two to ten workers apiece were distributed along the road at a density of 10 - 20 per hundred meters. All installations gave evidence of low capitalization, but all were electrified. The main sources of jobs for women and girls over fifteen were the new brick and glass knitting mills. Thus exports to the world here also brought in the cash that allowed the self-help approaches to household improvement, and this dependence upon world trade will become more important to Ogsudong in the future. Not only the logs and the Diesel engines came through that route, but also the petrochemicals for the synthetic fibers and filaments made elsewhere in Korea. Ogsudong labor produces apparel from designs supplied by studios in downtown Seoul for countries moving into the post-industrial era which no longer wish to take the trouble.

So it seems that when looking for the worst in Seoul we came upon an outstanding success story. In the course of ten to fifteen years Ogsudong progressed from a haphazard shanty community of peasants and small townsmen with little education or skill, but some with experience acquired in the military or in construction, all the way to an almost completed self-renewing set of neighborhoods with a stake in the metropolis, the nation, and even in world affairs. Most of the changes henceforth will be in the minds of the people -- their loyalties, achievements, associations, and feelings about right and wrong.

Added income will put tile on the last 5% of the roofs, add plaster to seal the last 10% of the walls, and install more dependable

heating equipment in perhaps half the houses. The lanes will be covered with tile or rough concrete, most often the latter. The steps cut into the rock or based upon loose boulders will be squared, and more fences and railings will be put up as accidents cause attention to be paid to hazards. Water lines will be laid, and electricity in the homes will become universal. The next community drives will probably encourage people to add a tree (emulating the rich at the edge), even if only in a tub. Multi-colored paint, instead of whitewash, and ornamentation of fronts should follow. Trees have already been planted at some of the entrances to the community, and a dozen have survived the first winter.

Factory jobs for women reinforce the interest in family planning; later on a greater equivalence in sex roles is expected. The large cohorts of children we saw will move through junior secondary school and then into factories or shops, with only a few continuing in the direction of technical or higher education. From now on the community will collect more and more old people -- the over-sixties that have formally retired from active employment. But all the while the rich man's terraces and the apartment houses for the middle-class will nibble at the edges of Ogsudong because of its fresh air and its views, both prized by those who wish to escape from the inner city.

Yet, if Ogsudong is like other self-improving communities in the world, this visible enhancement of the environment over relatively short periods of time is fraught with risk. Continued change for the better gets to be taken for granted. At each stage further improvement requires integration with still larger networks and systems that extend far beyond a community that little understands them. If,

because of circumstances in this larger socio-political system, the government or the employers cannot deliver up to expectations, the default is readily interpreted as injustice to local people. An accumulation of several such disappointments can lead to destructive collective anger. Ogsudong and two or three neighboring communities are enough set apart by natural boundaries and history from the remainder of the Seoul metropolitan area so that this anger can feed upon itself, escalate, and erupt. Political scientists and historians have noted repeatedly that urban unrest arises not among the destitute but among those who have progressed a good part of the way toward adequate levels of living. The youth and the very poor may join in later to take advantage of opportunities for looting.

It would be useful to know about the parts of Korea from which most of the Ogsudong people came, and more about their religious, recreational, and social institutions. That information requires an analysis that tunes into the speech of the people (Korean dialects are as differentiated as the English or German ones). Those traditions could very well move Ogsudong away from the mainstream and point to a different kind of future. The needs of the people could then be better judged, and the likelihood for meeting them ascertained from a review of current plans in City Hall and the departments in the national government. Investigations at that level, however, would require several years study of the language before they could be undertaken -- a rather imposing hurdle.

Seoul's Instant Satellite City

In 1970 Seoul's flamboyant "Bulldozer" Kim retired from the mayor's office with non-specific charges of corruption floating in

his wake. Without question he would have remained in his post for some time, and covered himself with civic glory, had not some of the shortcuts taken in providing housing for the squatters occupying valuable land led to a disaster. "Bulldozer" Kim's solution for the urban redevelopment problem was a standard five-story walkup shell near to tops of the hills to rehouse the people displaced from the flatland, but one of the houses was put on the wrong side of a fault and slipped down the hill with about thirty casualties. His successor from Pusan finished the ambitious construction program, but then introduced his Pusan solution.

Being a military man, and holding cabinet rank due to the position of Seoul as a "Special City," he could use the authority of his position. New squatters were absolutely forbidden to settle in Seoul, as was new industry, and both were told to locate in the Kwang-ju district of the Seoul metropolitan area, which lies in rolling hills beyond the Greenbelt. (Kwang-ju has the vague meaning of "nice place," but it also refers to an ancient capital of Korea, now the seat of a province).

There are conflicting stories on the extent of the preparations before people began settling. The land was laid out in a grid, military style, with a few roads following the sides of the streams (their channels were straightened, and sand in their beds used in concrete). Brush on the hillsides was scraped off with a bulldozer and plot lines set, mostly at 20 pyong apiece (670 sq. ft.). Many families lived in tents through that first winter -- conditions must have been truly wretched.

Seoul City acted remarkably rapidly to fulfill its promises, but not enough to suit the residents. They raised a rumpus, which

led to a separate city being formed, named Song Nam. Intellectuals voiced open criticism of the results, but most of the complaints revolved around the observation that Song Nam fell short of being the ideal garden city. Nevertheless 300,000 to 400,000 people have settled in it over the past four years, almost all of them apparently feeling that it was the next best alternative, now that living in the city itself was forbidden.

The phenomenon was worth taking a close look. We caught the bus near the East Gate of the old city. It took us over the third bridge of the Han River and onto the toll road. The Greenbelt has hillsides of newly planted pine trees and valleys that support villages obviously swollen by immigration. The recent housing with its new materials exceeds by far the traditional. Vegetables and rice grow in the fields, and farm animals are infrequent. A few miles off the toll road, forty-five minutes from Seoul, a solid hillside of cottages, dotted with a half-dozen cross-crowned steeples, comes into view, then another, and more.

The surprise for us was that electricity, schools, water, and drainage had been completed earlier than for comparable instances in more developed countries. Sewage was collected from out-houses and depositories, lending a rich smell to the greenness of the fields. We climbed a hill and lunched on the land reserve overlooking half of Song Nam. Just below were the relicts of a village, thatched roofs on barns, cows, oxen, small horses, and tarpulin-covered hay ricks.

Three neighborhoods are almost complete, two more are half-filled, and several more are just beginning. The factories are difficult to identify by their appearance, but there is at least one

rubber company, and several food processors. The inevitable building materials firms are present, and probably several knitting and garment making facilities.

Clustered in small contractor-built, crowded tracts, the more stylish housing in Son Nam sometimes includes some steep slope within the private plot because it could not otherwise be developed. Again the bright blue glaze on the roof tiles indicates status, as does rough red brick walls. The gates have sheet metal doors with brass pulls representing an eagle's head or that of a lion. At first we thought that they were provided with garages, but closer inspection suggested that the garage-size sites would be allocated to about twenty middle-class shops.

Many efforts on behalf of the public are quite noticeable. And within a few years all boulevards will be tree-lined, the litter assiduously cleaned up, and the fronts will be well-groomed.

The key factors for the formation of a stable community are the industrial plants, which bring strangers together as work-mates, and the large variety of Christian churches. Both of them were built along with the houses. No doubt many dramatic stories can be told about the industrial and religious entrepreneurs and the organizing of the congregations and the factories. The industrialists had to seek backing from the banks and find the key skills, while the preachers had to get the backing of the missionary societies and recruit members to build the churches. A few chapels have been built without outside assistance; they seem to be more heavily used than the others.

There must have been a team of planners and administrators who fought for their new town and for the jobs that it sorely needed.

As compared to other new towns in poor countries, one would have to say that Song Nam is the most economical and rewarding instance so far reported. This combination of self-help in house building and small contracting certainly produces more satisfaction than that generated by the big contractor approach utilized in Japan, Singapore and Malaysia. If jobs can be found for the graduates of middle schools (there is every evidence that employees in this category will be in short supply in Seoul within a year or two), Song Nam may even evade the wave of juvenile delinquency that normally affects new towns a few years after they have been launched.

How it really happened, rather than the official version, is a story that should be told. Other countries have much to learn from it.

III. THE UPPERMOST VILLAGES ON KOREA'S MOUNTAINSIDES

The squatters originally migrated from rural areas where life was intolerable. The stresses placed upon a society are revealed more clearly by conditions in the villages at the head of the valley than by the appeals made to the legislators. In the Mediterranean world the hill people not only raised different crops, tended different animals, and used fewer machines, they were often ethnically and even linguistically distinct, so an integration problem was superimposed upon a poverty condition. In tropical mountain areas the technique of shifting agriculture is often practised by people ethnically alien to the agrarian masses on the valley floor. But in Korea the turmoil of the past seems to have homogenized the population to about the same extent that is observed in Japan, England or Sweden. Thus the environmental stresses gain more importance than current feuds and historic conflicts between ethnic components.

If the population expands in the upper villages, poverty inhibits investing in the extra fertilizer and better irrigation needed to meet the demands of extra mouths. The only option is to build terraces intended to catch a marginal crop of barley or potatoes still higher up the side of the mountain.

If kerosene and coal become scarce, the uppermost villages are most likely to resort to cutting faggots and poaching trees from the forest. Mountainsides are denuded and erosion sets in in areas within a two-hour walk from the villages. Gullying intensifies the

pressure on the poorest villages; their soil is passed on to the delta below with its more populous communities.

If a drought sets in, the upper wells and water sources dry up first, and the transport effort required for bringing up emergency water by tank truck is usually of too great a magnitude to undertake regardless of cost. Therefore people and their livestock must take to the roads in order to survive.

Although the highest villages are less subject to plant disease than the people farming the bottomland, they often have to fight the wild pests that inhabit brushland and forests. Rabbits and birds are major crop threats, so they are killed, and vulnerability to rodents and insects increases.

These recurrent extreme stresses have some unusual social consequences. An uppermost village, for instance, will suffer from true over-population first, causing the youth to migrate overseas, join the army, enter the merchant marine, or take up casual work in the metropolis. The first to establish themselves in a new locale find places for relatives. Women follow the men, if they have not gone too far. In some societies the successful men endow their village, others send remittances, and a few even retire to their home village. A handful have run afoul of the law and depend upon relatives and friends not to report their presence.

Thus a history of deprivation and migration to a city can bring capital to a village, as well as urban culture, religious devotion, and independence from the law. It can lead to an earlier introduction of schools and a generally more educated outlook on life than the agrarian masses. But more often it leads to a community in an urban slum that shares the same kinfolk networks with the mountain

village. City migration allows both the abandonment of the highest village terraces and a cessation of desperate hunting and food gathering in the forests that depleted wildlife and rooted out otherwise common species, particularly birds and small mammals.

Briefly, these are human ecological histories of marginal settlements where the immediate environment is tamed, but climatic variability is extreme. The range is great, even for countries with climates similar to South Korea, but the indicators provided can often predict change for the bulk of the population somewhat later (e.g. emigration, drought response). What does one see in Korea in 1974?

Around Mount Kaya

Over the past few years most of the villages have been connected with towns and cities by means of gravel roads and modern buses. The roads are primitive in many places yet, and culverts are missing, so the buses average only 15-30 km. per hour over gravel roads, the bumps throwing passengers and produce together on some occasions.

On the side of a major mountain range the bus goes no further than a point a bit more than halfway up, its "stopping" (the word is shown in English when little else is), in a village at the confluence of two or three major streams. After an 80-120 minute run on one-track roads predominantly, the driver takes a break. The girl (stewardess) usually has to wash the dust off the front and back windows. A circle of tiny shops cater to the trade -- canned goods, dry goods, green grocer, fruits, drinks, tea shop, perhaps an inn (the National Park had several inns, a dozen souvenir shops, and a night club without patrons on a Wednesday night). In nearly all cases a school, almost always less than ten years old, will be nearby.

White rushing water tumbles over the rocks. With a pine forest on the surrounding ridges, it looks mountain pure; people go down to brush their teeth, and wash their feet, but they do not drink it. In a densely populated country one can be virtually certain that a number of villages upstream have been using this water. Their wastes, and those of their animals, go into the irrigated fields that are drained by the stream.

Two or three tracks lead off to higher ground. Let us take one that follows a stream. The very early morning traffic consists of men coming down to take a bus to work as laborers in the valley farms, in construction, or in town. Later come the school children, serious and purposeful teenagers first, then the sociable middle school attenders, gleeful and curious, and finally the primary school group that is alternately dawdling and running, chasing butterflies, chipmunks and each other.

With roads like these the bicycle loses its utility. Even scooters and motor-bikes are jolted to pieces, although they pick their way along better than bicycles. Therefore people walk, often carrying their produce in a bowl or a shawl on the head (if a woman or girl) or in one of several types of A-frame pack racks. A few hand carts like those omnipresent in lower villages may still be seen, but their use is short range. Curiously, although there are oxen, there are no ox carts, which make Korea very different from the rest of the Orient.

Sin Bu Rak, the terminus for the bus in Kaya National Park, is accorded a sign announcing this fact. The villages above, although not nameless, have no such formal introductions. The first, about a kilometer above, specializes in peonies. Flowers are planted in

the plots in the best sun and water, while the potatoes, turnips and cabbage grow in any remaining space. Houses made of pre-fabricated siding with corrugated iron roofs, most of them seriously rusting, although two were brand new. Outhouses and sheds were all thatched, but with field stone and old lumber sides. I deduce that this was an aided pioneer settlement perhaps 15 years ago, the peonies part of some self-help project. Now perhaps three-hundred people live there with a few cows and no dogs (again surprising for a mountain people).

The second village obviously had a long history. Some of its houses were of the old-fashioned wattle-and-daub with thatch roofs. Others had acquired tile roofs, glazed dark rather than a shiny red, blue or green. This village had three or four hole-in-the-wall shops and a wine-drinking place.

The third village, less than a kilometer beyond, clustered less than a hundred roofs, with perhaps one shop and one for socializing. It sported one strip of peonies, perhaps the result of a marriage from down valley. This was the poorest by far, since only three roofs were tile. The water supply came from above, but the flow was small only a week after a heavy rain. Presumably it was also the highest, because by now the trail had been reduced to a single track for man and ox.

Yet when following a rivulet that fed the waterfall, we turned around a hillside and came upon yet another settlement. It was a cluster of nine around a shallow well, where each house was pre-fabricated and identical at the start, but then each family added out-buildings of thatch. They had prepared some new plots of rice paddy, less than an acre in size, and had terraced upward, pushing back the edge of the forest, to get enough land to grow potatoes and barley.

Around all of the villages along the way, but the last two most noticeably, we could see abandoned fields growing up in brush. A fair share of them were lightly terraced with stone, suggesting brief recent cultivation. In noting the relation of school children to houses, it is apparent that the population has been growing. Where does the extra income come from? It must have started no more than five years ago. Very likely migration followed by remittances is the answer. The rapid economic development in the cities would change the poorest villages in this way. The recent new construction in the Park merely reinforced a trend already in existence. The fields abandoned due to the opportunity the Park presented would only be used to grow grass and spring flowers.

There were barely enough cattle to supply oxen for ploughing. No sheep, no goats, and no evidence of deer in the forest. All this grass is going to waste! The Swiss would prosper in an environment that keeps Koreans on occasional short rations. The reason is cultural; Koreans do not eat cheese and very little else from cow's milk. Babies are breast fed as long as possible -- up to two years. And rice is held at such a premium that much single-cropped land could actually produce more food in the form of potatoes, maize, sorghum, peas, and the like, but does not. Oats, an old mountaineer's standby, are not grown at all.

In the same climate and with steeper slopes, the Japanese have gone into animal husbandry. However, as the roads improved, they discovered that the finishing of the cattle by feeding them imported grain near the cities has become a serious pollution factor. Thus the hope for Korean mountain villages in the future may be connected with the growing Japanese market for cheese, yogurt, and bakery

products, as well as a growing demand for meat. Most investment would be needed for all-weather roads, for pasture development, and valley floor feeding lots that allow the use of animal fertilizer.

Elsewhere in the South

A cross country bus charges over three mountain passes in an average hour of travel. Thus it is possible to observe many uppermost unisolated villages and their fields. We spent about seven hours on such buses, so the sample is modestly large as compared to what can be acquired afoot.

These roadside villages have not yet found a way of making a living from the traffic. "What traffic?" they may ask, because in that period only two passenger cars were passed. Even though it was harvest time, buses were more common than trucks, and a taxi or two ventured up to fifteen kilometers from town. The uppermost villages on the road are able to get their produce to market easily. This means they have an opportunity to move into bulky crops such as apples, pears, yams, and potatoes; but, except for the last, there is no evidence that the opportunity has been grasped. The labor saved due to improved transport has been invested in extending the area in paddy and in re-organizing for double cropping rice given favorable conditions.

A contrast needs to be made between Korean mountain and valley villages. In the valley, rice is harvested by hand using sickle or machete blades, and threshed by mini-machines. Plowing is done by oxen and by a "mechanical ox" that can power the thresher and pull loads of half ton or so. Each village passed had one or more of these tiny hand tractors under frantic repair. In the lower valley, rice

has been replaced by tobacco, grapes and some orchards. The plots of paddy in the uppermost villages are irregular, small, and often contain a boulder as an island or a peninsula, so hoe culture must remain important. We saw one man pulling a plow guided by another to plant a catch crop after barley, but this appears to be an unusual case for Korean agriculture.

Children in roadside upper villages are just as numerous as in the lower ones, if not more so because of boarders who arrive from places less well served, but they get to school more regularly. Although the dust raised by the traffic greatly reduces the quality of life, the investment rate in human and physical resources by the households themselves noticeably increases.

Strategies for Development

These rural areas, high villages and low, are the sources for the population expansion of the cities. At the same time, they are responsible for feeding the population. The cities can get staple foods on the world market cheaper than the produce of the Korean countryside. Yet Korean specialities may acquire an Asian market by taking advantage of the export promotion techniques learned in the cities. The difficulty is the risk for the society if trade breaks down. Korea must be able to grow enough of its own food to survive. So internal rice and barley prices are pushed above the world market levels in order to provide proper economic incentives. At a time when world prices have been declining, the internal price was hiked 40% just last month.

This tradeoff between development rate and security implies keeping people on the land longer than they would otherwise prefer.

What, then, are the cheapest ways of bribing them to remain, investing their efforts to attain the extra capacity needed to produce an acceptable mix of foodstuffs to tide the society over a crisis period?

Uppermost villages primarily need minor waterworks. This means small reservoirs, small canals, locks, gates, pumps, community water supplies and bathhouses (an appreciated luxury that can change a workaday village into a spa). With water control a wider range of options becomes available, and better educated farmers can take advantage of them to maximize returns. For the valley villages, water control often means better drainage and perhaps a transition to sprinkler systems and better lined canals.

The 4-H Clubs are already active, as is Agricultural Extension, so the experiments that mean most to villagers -- those that they can watch and compare -- can be carried out at home, and yet be aligned with national planning. "Know-how" diversifies within a few years, enabling even better options.

Electrification of villages is proceeding rapidly. One of the major justifications is water control, but lighting for the houses and television are sure to follow. The quality of life rises appreciably for everyone as soon as he obtains an electrical connection. This is the old T.V.A. and R.E.A. theme in contemporary Asian dress, and so very familiar to Americans. Telephone often accompanies the introduction of power, but it could precede it here. Koreans are not bashful about using the telephone, but the means whereby it will accelerate production in the countryside, once radio is introduced, are not clear.

Transport reform is well under way. Asphalt will come steadily, saving wear and tear on vehicles, first in the villages and along tourist routes, and later between them. That would permit mini-buses to shuttle between towns and villages, adding greater convenience for the less traveled routes. A dominant radial flow from the regional city will be a cobweb type of network super-imposed upon a presently depressed wheel-with-spokes pattern. Trucks will multiply in number even more than buses; if at all possible they should be equipped with benches to make them dual purpose vehicles, the way they were once before in Korea.

One proposed change is radical. The tiny meter-wide lanes can be widened and surfaced to smoothness to reduce the labor of pushing a cart. More bicycles, scooters and tiny three-wheelers could be used. In this manner, one man can get twice as much work done at peak periods. It allows more hand work to be applied to the crops themselves -- fertilizing, weeding, hoeing, pesticide application and harvesting.

The intent of these investments is to assure continuity of production, regardless of drought or rains during harvest. They are intended also to allow farmers to participate fully in the culture of the society, encouraging them to adopt family planning, utilize the educational system, organize cooperatives for distributing specialized produce, etc. These aims may mean that the uppermost villages on a mountainside that are neither close to a pass, nor suitable for tourism, may have to be abandoned. Better houses can be built near the end of the bus line nearer to the schools, the sources of electricity and the telephone. A well managed forest may

yield more for the entire society through its export industries than the occupation and tillage of marginal farms, but the practice of forestry in Korea is somewhat poorer than the agriculture.

In the long run one anticipates a considerable decline in rural population, resulting in the countryside operated by much older people with less physical energy. Japan has already reached that stage, but it was achieved by means that are not feasible for Korea, Taiwan, Thailand and other Asian countries: the demand for fossil fuels is too great. Coming later to the world market, Korean agriculture cannot afford to expend more than one calorie of fossil fuel for each calorie of food consumed, as in advanced countries. It must try for a ratio of one to three or four, with the major allocations to fertilizer, transport, and water control. Recycling of water is already elaborate, but the use of byproduct materials, such as straw for feeding, has barely begun.

So I expect that about a third of the uppermost villages must become "ghosts" within a generation or so. Their names may remain on the land, but even that is dubious because there are no churches, temples, or shrines to make the place holy and inviolable. They constitute separate systems in Korea only marginally connected to village settlement. What will be left will be a few sheds, unusually distributed rock piles, and the outlines of the terraces, each of them supporting vigorously growing trees. The streams will run pure again. The deer will repopulate the forest, sharing meadows with cattle and some sheep or goats. The birds will come back.

Memories of hard times are erased through age. These battles against an insufficiently provident Nature seldom make a contribution to history. Only a geomorphologist, one of those specialists who read

the history of the landscape from patterns exposed at the surface, would detect the traces of these human settlements on the mountainsides two generations hence. Perhaps, if the resurgent population of rabbits is not too greedy, the peonies in the rocks would be the trace that lasts the longest.

IV. THE NATIONAL PARKS AND THE ENVIRONMENT

Environmental concerns began to be expressed first in recent times in the royal gardens of Europe and Asia. A considerable exchange in horticulture and a sophistication in the design of gardens resulted. The nobility followed suit, with some dukes and counts specializing in forestry, wildlife propagation, or inland fisheries, so that techniques soon became enlightened through accumulated knowledge published elsewhere. Concepts of preserves, managed parks, and formal gardens evolved. Monarchs exchanged foresters, landscapers, and master gardeners, who took seeds, cuttings, and the secrets of the trade along with them.

In America little of this took root. Parks were begun as a service to the urban public, preserves of scenic beauty were maintained for the leisure class. The forests were almost totally cut down before World War I in order to provide ties and bridges for the railroads and frame houses for the growing population. Seventy-five years ago a number of popular controversies raged. Did the manifest destiny of the nation take precedence over the existence of the remaining primitive forest? Should the empty areas be replanted? So hot was the issue that the first professorial chair in forestry in America was established in the political science department of the University of Michigan. It was later admitted that a tree was a flowering plant, not just the object of a partisan poem, so the next appointment was attached to the botany department. Soil

conservation was added to the short list of concerns in the 1930's. It requires cooperation from people with little or no property, and therefore differs from its predecessors.

The recent excitement about pollution that started in America, which has now swept through most of the world, has been a young people's movement, especially affecting students who grew up in green, spacious suburbs. It is strikingly different from other radical movements in that "cleaning up the environment" had the general approval of parents and authorities. Sentiment accumulated in the 1960's, culminating in the first celebration of Earth Day in 1970. It was accompanied by the passage of legislation for enforcing strict standards of environmental quality. This interest in the environment seemed sure to sweep through the world as quickly as rock 'n' roll music and other features of youth culture. However selections would be made and priorities would shift as this assortment of concepts and concerns crossed cultural boundaries. The combinations of issues taken up in Asia, unpredictable from theory or experience, were interesting and worth knowing.

It happened that our daughter was finishing college at the time of peak enthusiasm about Earth Day. She was to join us in Asia, so I asked her to interview young bi-lingual students along the way. She found that stream pollution and air pollution were fairly well understood already, but the solid waste nuisance called "litter" was not comprehended, nor was there a word for it in any Asian language. The understandings were so culturally relative that her report was entitled "The Dirt is in the Eye of the Beholder." The Stockholm Conference has served to standardize informed viewpoints, but it uncovered the split between the developed and the under-

developed nations, with the latter insisting upon the freedom to exploit resources in order to catch up. However, all nations wish to put up a good front, so the national park idea for institutionalizing some central environmental concepts is readily accepted in a large part of Asia.

The national park system of South Korea is one of the newest in the world. Although previously talked over by people who had lived overseas, careful planning only began in 1972. The first report, produced for an international conference in 1973, presented a creditable, reasonably argued plan. Recognizing the vast gulf that often lies between word and deed, image and reality, we set out to discover the current state of the national parks.

It is perhaps unfair to judge the system from a sample of four of the nine parks laid out on a current map, but that is more than all but a handful of Koreans have had a chance to visit, either before or after the sites had been designated as national parks. These four are indicators of the variety and possibly the state of administration of the new system.

We had occasion to use the area north of Seoul on one-day scrambles a total of five times. The area around Puk Han Castle and Puk Han Peak was explored from a variety of directions. It could be compared with the condition in which I had found it in 1969 during a one-day hike that reached the old wall on the ridge tops.

Though extraordinarily popular, this area has shown marked improvement in orderly use. It is served now by scores of bus lines and hundreds of taxis that carry hikers and picnickers from Seoul, a half-hour away. Many tens of thousands of people are likely to be found on the ridges and flanks of Puk Han on a fair Sunday in spring.

Therefore the improvement represents a major achievement in environmental management and park administration. The conditions in this part of Korea have progressed further than those we saw in Japan in 1966-1970, although Japanese parks may also have improved significantly since then due to the popularity of the environmental issue there. But the Korean parks have a long way to go before they come up to European or American standards of quality for prime outdoor recreational areas under intensive use. The problem of litter control remains as serious as for Americans, Japanese, and Europeans. Fortunately the sources of litter in Korea at present are restricted. Cans and cartons are very scarce, while thin plastic and paper bags, some with bright colors, predominate. Bottles of soft drinks (almost all are American brands) and "white liquor," a cheap rice wine distillate, get broken on the rocks. The greatest change consists of traffic directed along the trails so that they are less likely to erode, employing relatively minor devices that seem to work.

We spent two days in the park at Mt. Gaya, one of the original sources of Buddhism in the countryside. The Hae In temple complex has new pavilions and facilities, built in partnership with the National Parks Administration. It could become the nearest equivalent in Korea to Japan's popular Nikko. The natural environment dominated by pines with branches akimbo looks like the original site pictured on scrolls by classical artists. There will be pressure for commercialization of the way into the Park, but a greater dependence upon buses in Korea, combined with a forewarned government, should be sufficient to prevent it from getting out of hand. The old-fashioned commercialization of the path to the temple gates with its

memento hawkers, souvenir purveyors dealing in pottery and wood, toy artisans, conjurers, street players, and animal trainers is almost gone. As soon as the "park village" is finished next year, these shacks and hovels may disappear completely.

The path to the peak is easy and gradual, leading to a demolished military post close to the top. A diesel powered tele-communications station with a lonely operator remains; it sits on the path well below the peak. Unlike American and Greek mountain tops, this one is left to the hikers. Mt. Gaya rises about 1350 m. above sea level, but one starts the climb about half-way up, so it offers no test of stamina, except to climbers of some interesting rock faces, many of whom painted notice of the dates of their successes in various colors.

Mt. Chiri, about 100 km. to the west, but unapproachable by direct route, is higher and far more rigorous. Being the tallest range on the peninsula proper, Chiri san is the least settled territory in the country. A loop route from the end of one bus line to another, going over the highest peaks in between, required one-and-a-half fairly arduous days, and even then we caught the bus back only because it had been late in arriving. Crossing the reserved wild area requires a full week.

This is obviously a park for small groups, although there are some refurbished temples on the periphery that invite pilgrimages of the faithful. Its nearest equivalent in America would be the North Cascades, but the resemblance is still not close. The Chiri district has an appearance different from mountains elsewhere in Korea because the pines contracted a disease which killed most of them, leaving some whitening skeletons on the slopes and stumps where

logs had been saved. The leafy hardwoods coming up, and the rank annuals in the understory, lend a lush appearance to a remarkably broken granite surface. A "down trail" is so much up-and-down that climbing equals the total height lost, and the circuitousness has no equal in all our experience in mountainous areas.

Chiri's clear, rushing rivers in granite canyons swept clean of boulders, with small waterfalls and deep pools, equal the best in the California Sierras, but are short in length before the waters are tapped by coffer dams to fill the sluices to downstream paddy fields. They form a beautiful trout habitat, but without fish hatcheries there are no fishermen. The streams do have scores of flat tenting ground beside them, many of which have been laboriously constructed by piling up a terrace of boulders and filling the interstices with separate shovel fulls of sand and soil.

Gyeong-ju is utterly different. It is a modernizing city, a railroad junction point with some industry, set in the midst of classical history. The Silla Kingdom of two millenniums ago was formed in this vicinity and the tombs of many of its emperors (hemispherical mounds of gravel and sand, grass-covered) are here. The city has recently built out around them. It has sacred groves, grottos, temples, archives, museums, and archeological diggings that present a tradition which will be increasingly romanticized in books, newspaper features, and television as Korea becomes more educated and develops a unique culture.

The national park designation seems to have halted an increasingly cheap commercialization and touristic exploitation of these ancient attractions. This park requires a top notch curator as

director, a man who can show off these national treasures in a manner that induces respect from local people and foreigners alike.

Surrounding Gyeong-ju are rolling hills covered with short pine and hardwood, with many hundreds of smaller tombs (1-2 meters high instead of 10-20 for the emperors). With its flowers and more gently molded rocks, this area potentially could be a high quality family picnic ground with miles of varied trails suited for all ages. The area already has pheasant and deer; it could be stocked with much more wildlife. Encroachments of paddy into the national park area are minor, and actually add to the diversity.

Design Features

Koreans must develop their national parks to fit both the energy shortage and a per capita income less than a sixth that of the United States, or a third of that of Japan. For five days through the southern part of the peninsula, covering 400 km. of gravel, asphalt, and freeway, we saw only two passenger cars! This is far more spartan than any other Asian society, except possibly Communist China. Much of the population is still on a seven-day week with a few holidays traditional for their occupations as well as nationally proclaimed holidays.

Rural people are frugal and hard-working, as expected, but will spend freely on a pilgrimage or tour. One of the rare sights of the trip was an older ladies club from some village, each member in her traditional full dress with multiple petticoats, dancing in the aisles of the railroad coach, snapping fingers and calling out simple tunes, old and new, waving money in anticipation of the good time they all expected to have.

The parks begin at a bus unloading area; some of them are already laid out and others are under construction. Gates charge 12-25¢ (half for students) for entry into temples and museums. There may be as many as a half-dozen such features, some of them requiring intermediate transfer by the bus, so the cost can build up. The preciousness of the attraction requires landscaping and a carefully preserved exterior. The picture post-cards and circulars advertising the tour present this facade, and seeing it is confirmation that one has actually arrived. On a number of instances it is not the gate itself but the sight framed by it. Entry sets the stage for a collective drama of participation. After that the paths and trails begin. Their marking follows traditions already well understood. Red and black lettering is used, and certain Chinese characters appear, even though few Koreans use them or remember their precise meaning.

By Korean standards the trails are well maintained, but that means something different from either European or American expectations. Around similar spas and reserves Europeans built paths for leisurely walks, decked and trimmed with formal gardens at special points and landscaped to enhance the prospect. Bridges unique to that region are constructed, as well as hostelrys at convenient places. The Americans shifted from pioneering pack trails for horses and logging tracks to the needs of the back-packers coming through at a rate of five to several hundred per day; they put switchbacks on the steep rises and ran the surveyed trails on the dry side of the ridge to extend the length of the season that the trail could be used. In America, trails are designed to allow the hiker to cover as many miles as possible in a day in order to reach the scenic points or the established

camp grounds. Therefore, the steep grades are evened out with blasting; sharp, broken rocks are sprinkled with coarse sand; and chasms are bridged. Thus American trail construction has almost become a branch of civil engineering. People learn to walk for hours under these conditions, but that kind of pace is not for Koreans.

Everywhere one looks, at work and play, the Korean way is to put out short bursts of intense activity until they become completely exhausted, then they slow down or rest before undertaking another such flurry of activity. Therefore, trail maintenance, such as posting signs, sawing off impeding branches and saplings, pushing a few boulders into the watercourses at crossings, offers rest points about every quarter-hour. It is not surprising then that Korean trails are very circuitous and litter appears periodically.

Mountain huts appear to have come to Korea from European sources. Once rare, they are now being built in the obvious places. We took refuge in one during a spring shower near Seoul, finding that Korean choices for internal dimensions fit their needs quite precisely, but people our size were cramped, bumped, and generally uncomfortable. They did not have fireplaces because it was expected that each small group would cook for itself, and rarely did any have a source of drinking water, since Koreans cook rice even when in camp and tea was taken for granted.

They have invented a much better solution for more distant mountains. At a Buddhist shrine on the side of Mt. Chiri, two old widows maintain a set of crude cabins to be used as rooms by the hikers. They garden enough to fill their kim-chi jars, and are donated surplus rice from the provisions of hikers, to whom they

provide a local herb tea. They get enough from the hikers -- about 25¢ per-night apiece -- to live there the year round. The site is nicely arranged, as are most temple sites, at the topmost place where water can be obtained without fail--a location that would almost certainly be fouled by campers if no caretakers were around.

The frequency of peasant widows without sons will increase rapidly for several decades in Korea; here and elsewhere they can take care of each other and the environment as well. They really do need a radio-telephone at each such refuge, however, as the mountains become more popular.

American park designers have been more concerned about the characteristics of "crappers" (taken from the name of the inventor of the water closet, not merely a descriptor), than any other nation. Koreans have been so oblivious of the need, that water closets sometimes do not exist even in the bus terminals. The latrine on the side of Mt. Chiri was the most primitive we have seen. Usually it has been improved up to the level in the floor of a free-standing closet, perhaps thatch-roofed. There is no need to differentiate by sex, except in high density, urban-like zones. It will be interesting to see the set of Korean standard solutions a few years from now, after they receive enough complaints from foreign tourists.

Another gap is a "camping" plot at the end of the bus lines, as is found everywhere in Europe. The American campground is much too ambitious, and quite inappropriate. Then if one misses the bus, or encounters inclement weather, a tarpulin or pitched tent will protect such a visitor from the elements. Since the upper villages in these mountain areas are being encouraged to use a flat terrace

for mulberry trees, allowing campers to use them for supports, and not take any land out of production. The collection of faggots and windfall trees could be made to pay somewhat better than at present for the villagers since Koreans also enjoy bonfires. However, almost all of them carry tiny pressure stoves to guarantee that their rice gets cooked.

The overall appraisal of the national park system, therefore, is favorable. A wide selection of environments is being preserved by plan, and the mode of development fits Korean needs rather closely. Some of the parks may well gain international recognition. The most popular sites will require closer attention to the total recreational open space experience.

V. YOUTH CULTURE IN KOREA

A recent item in the English language press of Seoul announced that 11,206 young men had been picked up by police because their hair was too long. A few days previously it had been admitted by the government that this extreme fashion imported from foreign countries was opposed vigorously. Those who had been in Korea for a while saw those two items not as confirmations, but as the first public recognition by the police that they were dealing with a social force rather than corruption. Police officers are given complete freedom to decide who looks effeminate in his hair style. Almost all are taken to a barber, who cuts it on the spot, so that the hair does not go lower than the collar. About thirty resisted one way or another and were locked up for a day or two. No allowance for appeal has been made, the individual policeman's opinion is indeed sufficient. The large numbers involved (in Seoul equal to all other instances of juvenile delinquency combined) indicates that the police are facing a phenomenon with which they cannot cope; it exasperates and mystifies them. Now the ladies' beauty shops are getting new customers by guaranteeing to curl boys' hair so that it will not fall over their collars -- the hair can be legally short, yet long.

Hair is important in Korean society, and has been used as an indicator of social separation since the time of the Empire. For school girls, special hair cuts are used as perpetual uniforms which allow cinema and theatre attendants to identify them (and usually exclude admission). The controls placed upon young people by the

community and the State resemble in many ways the situation in America before World War I when many blue laws had been adopted, including local prohibitions upon liquor consumption. In each instance the regulations were designed to keep people from straying from conformity to precepts of church, school, military practice, or corporate image.

Everyone recognizes that Koreans, almost to the extent of the Japanese or Chinese, can behave in a beastly, aggressive, anti-social fashion when outside their kinship and community circles, so the city must use its authority to maintain order, and it is easier to maintain external indicators or tags exhibiting conformity, such as clothing and hair style, than to depend upon a comprehensive network of intelligence. Of course the Korean CIA does maintain surveillance over those who are suspected of potential contacts with the North, and restless students and intellectuals. As a result, the street scene in Seoul has color, variety, and decorum, except for some horse-play among the young men, but no extremes, such as women in shorts, miniskirts, or décolletage. Each person is able to distinguish himself from the mass through choice of clothing and personal grooming at little extra expense, or he can adhere to any of a score or so stereotypes.

According to a recent anthropological study, the original rural Korean culture stresses separation of age-mate for purposes of sociability, and in the city the bonds between classmates are unusually strong.⁴ The selectivity of the examination system in the Korean secondary schools until now -- they are being reformed in

⁴V.S.R. Brandt, A Korean Village Between Farm and Sea (Cambridge: Harvard, 1971.)

stages, the first change occurred about five years ago and another is starting this year -- created obligations that resembled those of a fraternity-fellowship, reunions, introductions to prospective employers, introductions to girls, and travel companionship. Thus age-mates and classmates socialize differently from their counterparts who attend Chinese family banquets and picnics, sometimes on the graves of ancestors, but with less latitude than Japanese equivalents imbued with strong corporate loyalties yet free to initiate external contacts in ways that allow more extreme behavior.

This generation of Korean youth contends neither with war nor with the struggle for existence. The transportation system has become quite convenient, radio is everywhere, television is accessible, little restaurants and coffee houses offer Western music, and whatever one saves can be committed to tape decks and plastic guitars. Popular Western culture conveys a sense of freedom, escape, security from interference by elders, novelty and challenge, and above all, romance. Military service in units trained by disciples of the Americans has been levelling the male culture by destroying the class lines even more completely than the impoverishment of the nobility. Perhaps the strongest message carried by the nostalgic popular music and even in the "Nashville sound", is the possibility of equality between the sexes--a particular reduction in communication barriers. So occasionally now one finds, in selected places in the City, teen-agers holding hands. The intelligent, stronger-willed girls are most attracted to mutuality of relationships, but the boys are usually baffled by the demands of a Western date. The universities set up a carnival for blind dates to get over this hurdle, but obviously it helps only a minor fraction.

Among the youth, the field of attention that is devoted to imagery has now been taken over almost completely by international popular culture, (80% American, 10% European light classical, and the remainder Asian hybrids of one kind or another). Only four years ago it was heavily traditional and the eccentric Korean who had mastered a half dozen American songs, putting on fair renditions, was the darling of Armed Forces Radio because he seemed to be unique! Yet censorship is certainly quite a bit more strict than in the West; face-to-face contact with the touring pop groups and the singers is not allowed. Police do not wish to be put in the position of having to cope with tens of thousands of raving adolescent enthusiasts around the biggest cinema house in the city. It is more convenient to ship them out the day they arrive. Symphonic music has the approval of the educated classes and a remarkable number of the university students are mastering the respective instruments. Where family and group controls are strictest, the organ is popular, and choral hymn singing becomes the proper application of musical interest. Arrangements of gospel songs go onto the same tapes as popular music to fill the Muzak niche--the barrier between the sacred and the profane has not yet been defined for contemporary culture.

Postponement of the age of marriage--like the Chinese, the total ages of bride and groom now typically exceed fifty--means that this susceptible period can last for six to ten years. The unplugged holes in the censorship system, primarily channels leading through the commerce with Japan and Germany and the American armed forces, serve as strong confirmations for those who look outward from the society for signs to guide superficial or prosaic behavior.

Korea has to cover a lot of ground in its catching up, so that the imitation of complex performances is the quickest and easiest strategy. The livelihood of a rapidly increasing segment of the population is dependent upon staying up-to-date. If product designs for the export market in apparel should lag by only six months, Korean firms would be stuck with inventory and many poor people working in the mills and lofts would suffer. And the same consequences would be felt if the censors overrule the negotiators in trade development. The concept of "face" in this society must be responsible for producing some of the motivation to catch up; the bases of face are shifting to become more like the American, and therefore less visible to us except when we encounter situations more parallel with our past than with the present levels of affluence. Most families, and the ideals upon which the educational system is based, instill a strong urge to achieve higher status, but not necessarily to reach the highest possible levels of competence. In Korea, lost face can be regained through achievement, and achievements are increasingly judged by standards of cultures other than the traditional Korean one.

Now it is clear why an urban futurist should be so interested in the invasion of popular culture. It brings with it many unprecedented attitudes, new norms for behavior, extra targets at which to aim, and new self-created social roles to fill. The extraordinary effective efforts put into achievement by the Koreans must be aimed at goals they formulate from this borrowed experience. If we knew how to survey the breadth of experience acquired with overseas symbols, and

could discover a cheap, simple way to explore Korean interpretations, we should get a fair forecast of the social change to be anticipated over the next two decades.

One senses the poignant quest of the youth when coming down from the mountain peaks outside Seoul on a late Sunday or holiday afternoon. In the upper water courses, far above the resorts, various youth groups try out their Western culture. Remember, mountains climbed symbolize achievement but guitars carried represent at least ordinary competence in an alien craft, while the music and song heard echoing among the cliffs signify the collective choice for experimentation. They drink out of Sierra Club cups, wear jeans, ski jackets, Italian style boots, although sometimes locally made rubber-soled shoes that are more practical in these mountains, or knickers with wool socks if they wish to declare their orthodoxy. The male-female ratio runs 60-40, due to a complex arrangement for chaperonage. On sunny holidays it seems like a quarter of all the enrollment in Seoul universities is up there practicing. By American standards the level of expertise seldom reaches a fair high-school level, and the English words to accompany the guitars are unintelligible in different ways than intended by the composers, but by Asian standards the quality is exceeded only in Japan and the elite groups in Bombay. That is not bad, considering the recency of contact and that filling the role of student in this society imposes 10-11 hours per day upon a person just to fill the basic requirements.

An assessment of the potentials for the future requires some sort of projective test. In it young people should be encouraged to fantasize collectively in a game-like situation where one person's idea

is topped by another's until the conversation reaches a void which none has explored. These sequences of reported experiences followed by wishes extended by daydreams probably move out in many directions. Then it may be possible to identify a few patterns in joint speculation, producing futures that can come true if the right context is presented.

An Experiment

I was much interested by an unpublished attempt by Robert Edward Michell (now at Florida State University, Pensacola) to explore similar culture changes in Chinese society as affected by the colonial laissez faire environment of Hong Kong. He arranged to have a mixed group of 14-16 year-olds sit in a room with a tape recorder. They were told that they would be paid a liberal shop assistant's wage as long as the tape recorder registered talk. In order to stimulate conversation and break the embarrassing silences, he set up three bottles of orange soda, one with an old colonial trade name, the second from Communist China, and a third with an ultra-modern international image (Schweppes). They were encouraged to think of occasions in the past during which they had drunk any one of them -- or someone else that they knew had -- and describe what went on, what people thought, and what would be a better way of behaving. There is a strong tendency for one story to be topped by the next, with increasing frankness shown as the stories progress, while all parties become quite oblivious to the presence of the tape recorder.

In Hong Kong this technique revealed that the traditional Chinese family, as described by sociologists, psychiatrists, and anthropologists, had virtually disappeared. Any population policy based

upon those presumptions would surely not work. Nevertheless, what had come out of a merging of East and West, strongly through exposure to television, was a new kind of family structure that seemed to be more flexible and more cooperative than the more traditional one in which the parents grew up. The new one produced tragedies, but they lingered a much shorter period, and less seldom were followed by internal feuds. The coherence of the new semi-modern family could be explained by the introduction of third party issues which could be mulled over by the family, often around the dinner table. Particularly the concept of the "scandalous" was shifted, because the continuation dramas on television, and radio before it, were repeatedly taking up the ambiguous features of existing norms. They were especially engaged in building up the possibilities for romantic love and dating. Of course for each of the youths these soft-drinks introduced a possibly vivid decision in the course of their own first steps toward dating and the embarrassment that the occasion entailed.

The Korean middle class has an educational policy that often separates the sexes in middle school, and almost completely in high school. This causes both girls and boys to build very high defenses against any expression of informality or affect, yet at the same time they crave it. This came out clearly in a Sunday newspaper column when a senior coed remarked to her uncle (a sage in the newspaper world) that young people in the universities lived in a prison created by themselves and did not know how to use the freedom of association offered to them on the campus. She recounted an incident involving a young man who was under great stress because he was being drafted (a three-year hitch in Korea). He blurted out his resigned

love, felt for years, but always behind a reserve so that in all their contacts no clue was given. He felt sure that by the time he returned from the military her life would be fixed by a marriage or a career, so this day was the last that he could worship her at a distance. This young man was not a marginal type that one finds in any society, but definitely the most intelligent and most attractive male in the class, a leader among men. The sage had no answers either, only sympathy.

In Seoul, entry into the youth culture is focused in the coffee house, which in Korea does not serve beer or liquor. Customers learn to be sensitive to fine distinctions in decor, music, and service, so you can find the kind of people you are in a mood to meet. The drinks do not really matter and are seldom remembered, so it presents no analog to Hong Kong. Better, perhaps, would be a more controlled projective test -- such as a half dozen sketches of people interacting in coffee houses to be interpreted by groups.

Just thinking about a projective test and the inventory of perceptions that it could generate adds to one's ability to see social interactions. For Korean behavioral scientists such a study has little utility; they are engaged in discovering how Koreans respond to standard tests evolved in the West. They may move a step beyond to add perspective to problems of fundamental national policy, such as the modernization of the educational system and the extension of family planning. Therefore, for a while at least, the Koreans will move forward into the future without all the self-conscious analysis of internal change encountered in America and Europe. We outsiders can see that the change is so rapid there is insufficient time to construct reasonably reliable instruments.

VI. INSTITUTION BUILDING IN SCIENCE AND TECHNOLOGY: KIST AND KAIS

While moving about in the Orient I have been recommending that scientists should be employed in a way that they contribute quickly to the borrowing of appropriate modern technology--as in Korea. In particular, the Korea Institute of Science and Technology was referred to, since I had seen it starting up in its new building in 1970. But was it still following in the path laid out for it? One could not go in and ask such a question; a plausible entree was needed that would allow me to talk as one scientist to another on problems of mutual interest. At the UNDP the mention of a proposal on the part of KIST to manufacture the ingredients of birth control pills, a subject which I had covered in a book assessing the social, economic, and cultural effects about the time that the pills were put on sale, introduced such an opportunity. I arrived carrying a copy of Carl Djerassi's report on pill manufacture in the People's Republic of China.⁵

Their project seemed to have real merit. It reveals much about the organization. The proposer was a Dr. Chae, Yung-Bog, a Seoul National University graduate who worked in Germany, getting a doctorate along the way, spent some time at the Max Planck Institute for Cell Biology and then was passed along to Severo Ochoa in New York City when that medical science super star was running one of the

⁵Carl Djerassi, Studies in Family Planning, The Population Council, January 1974.

fastest paced laboratories in molecular biology and biochemistry in the world. His job in KIST is to develop the labor-intensive fine chemicals industry for Korea. In the last three years they have already carried more than a dozen projects to completion and have a much larger number well on the way. They were confident of their ability to push this project through because they had already brought an anti-tuberculosis drug up to pilot plant production. The method of organization employed is that of small teams, resembling the American rather than the older European system. They hoped to start from a cheaper raw material, cholesterol, and take a slightly different route of synthesis using fermentation at a critical stage. They had an advantage over predecessors who had tried and failed because they had recruited a Korean who had studied in Japan with a university team that had converted cholesterol to estradione, from which it is clear sailing to the principal constituents of oral contraceptives. They obtained a patent last year, but it is still unused by Japanese firms. They would not need a license for the captive market supplied free by the Government, because the patent was not registered in Korea.

I introduced the idea of proceeding to the "paper pill" developed in Shanghai in 1972-3, where the biologically active ingredient is absorbed in a square of water-soluble paper, the size of a postage stamp. It is likely to be even simpler than standard pills for very poor and backward rural people. Producing the water soluble paper is quite simple for them; the principal challenge would be to take advantage of the simplicity in the remainder of the formulation and packaging. Might it not be possible to be the first country in the non-Communist world to produce paper pills?

There was at least one hitch. KIST is not set up like a corporation. An idea like that would require a techno-economic survey, and the group responsible for such surveys in KIST needed a contract to make a study of the potential markets and risks. But most agencies request a thoroughly justified proposal before they will offer a contract or grant. Korean pharmaceutical firms are unable to make the commitment to a product that may be given away free. Thus the standard operating procedures of international, national, and corporate organizations do not fit each other quite closely enough, so another meritorious proposal may have to wait. KIST has some budget to gamble with, but on a project like free pills, no one has yet thought of a way of recapturing enough of the benefits to be paid for by means of its enterprise. In all countries the interface between development ideas and the sources of funding has many cracks and crevices into which unlucky projects fall; undoubtedly more fail to traverse the gaps than succeed. Technical and economic merit is rarely enough to produce a success. Careful management and planning can rule out many of these extraneous factors--if the planning is not hobbled by charters, lack of staff, or budget--so that the odds are improving.

Vice-President Yang of KIST came into the office. He explained how his organization worked with KDI, The Korea Development Institute (which does long range thinking for the Economic Planning Board) and KAIS (The Korea Advanced Institute of Science) which was supposed to retrain the output of engineers and scientists produced primarily in America. They had obtained degrees that resulted from the fads that provided fellowships and training grants but were soon

displaced by new American public concerns. KIST would be one of the benefactors of KAIS, but the new industrial activity using its applications of modern technology should be aided even more.

For each of the Government ministries a handful of private enterprises serve as designated agents, but for birth control pills no such firm could be identified by the chemists. There were pill fabricators using imported ingredients, but not pill designers. The knowhow exists, however, in closely related fields, so KIST would probably have the task, through public relations or personal contacts, of setting up a designated agent or two. A shift in the political winds may define this procedure as corruption, so at this point in time all parties are hesitant to move.

From my knowledge of science in Asia, the Koreans have the men, the equipment, and most of the organization needed to develop non-Communist paper pills. Their deficiencies are much less those of any other country in Asia, except Japan, and they have some advantages over Japanese firms based upon their growing internal market. It will be interesting to see whether the bottlenecks are broken, and if so, how. If they are, a whole new class of fine chemicals would be added to the Korean repertory.

The Challenge Facing KAIS

A similar introduction was needed in order to appraise the direction of the development of KAIS. That chance opened up as a consequence of a lecture given to planners in the new School of Environmental Studies at Seoul National University. There, among other things, I presented the special challenge of developing a "cycle mode of transportation" along modern lines as the best single solution

for a permanent energy shortage. A Dr. Yoon, Duk N., from KAIS was present; he disclosed that he had been thinking along parallel lines, but more according to the theme of appropriate technology, or "intermediate" as it was known until about two years ago, and therefore considering the design of devices rather than systems. He invited me to visit and give a talk to the Science and Technology Society of KAIS. He admitted, upon being pressed, that his interest in human-powered transport was not shared as yet by his colleagues, so a topic thought to be of general interest (because advice to the Government was being prepared) was chosen: "Long Range Planning of Science and Technology Education". Oh Byungho, an urban studies senior at MIT, came along to listen; his presence helped noticeably.

We were picked up by Henry Fuchs, a retiring professor of design in the Mechanical Engineering Department of Stanford University, who made the insightful comment on the way that the Koreans lacked much of the intuitive grasp of ingenious solutions that he found among Americans and Europeans (Fuchs came from Austria, probably a refugee from the 1936-8 period). Koreans spent a great deal of time pumping new values for parameters into involved sets of equations, and often lost contact with the empirical world--a characteristic he attributed to their borrowed Confucian heritage. I could only agree that this was true from our Western point of view, but I detected a different kind of creativity, not ordinarily revealed to outsiders, which invented organizational shortcuts and alternative procedures that enabled the achievement of collective goals. Their organizational inventions probably have general applicability, but they are still framed in particular referents within the Korean language.

They can be diffused as analogs within a Korean bureaucracy, but remain trapped in untranslated, or occasionally untranslatable, form in the subculture.

The building for KAIS, situated on a low ridge to the north-east of the capital with a clear view of the peaks of Puk Han San, is the most carefully finished of any structure in Korea. Oh Byungho remarked that it could fit easily into contemporary MIT. This is an institution that was obviously launched with a space age budget, i.e. USAID when technology was still high priority. Virtually all members of the staff were group leaders in American R & D organizations, or had been teaching in universities, before returning to Korea. Something like this building was needed to reassure this talent that Korea was rising out of the mud and poverty they remembered; their intellectual skills were likely to be of some value to the society as well as yielding some reward for themselves. Americans originally thought of it as providing "nuts and bolts knowhow" by retreading American-trained Koreans for semi-developed industry, and were becoming a little disturbed by the trend toward computerization and theoretical models that seemed to the Koreans to fit the context provided by the building. In this disagreement about institutional direction, my tendency to think in terms of long-range planning considerations put me on the side of the Koreans. But did they appreciate the system that would consolidate their jump into the fully modern world?

Introductions were very informal. Each described his technical field of expertise (materials science, physics, computer technology, chemical engineering, organic chemistry, civil engineering, biochemical technology, food technology, mechanical

engineering, etc), and some of his interests. The group was limited to the size of the seminar room--about fifteen. Therefore an appropriate common language could be found without trouble.

The talk itself contained the following arguments:

1. Science and technology education contributed to net development starting about twenty years after the teachers were trained, and about thirty years after the policy was established.
2. Yet policy was usually based upon the experience of the previous decades, with no careful assessment of how the society and the world will have changed before the returns were expected.
3. Example in the U.S.-- Space age education reform has already pushed the students in a direction opposite to that intended. (Note that educational projections for science have failed in all countries.)
4. Open places in advanced American engineering schools, once local youth showed lack of interest, were granted to the best applicants, about 70-80% Asians for the more theoretical departments; they are now working primarily for multinational corporations.
5. Meanwhile the multinational firms have evolved a means of moving capital from one nation to the next, despite exchange controls of the nations.
6. Therefore, in the future, the sovereignty of nations must decline further; they are losing control over both the capital and the people needed for extending technology and new social services.
7. Moreover, the trend toward a post-industrial order will have been largely accomplished in societies that are open and interdependent, such as Korea.

8. Therefore, a productive science education policy should anticipate an urban society heavily committed to providing high performance human services according to international standards set by multinational organizations much more than by nations. This is the most likely non-catastrophic future.

9. Examples were taken up for food, transport, and communications, outlining how this future would apply to Korean policy-making.

The objection from the KAIS participants was that this kind of thinking was too broad for them, even though they were broader by far than the main body of KAIS faculty members. They thought that it was more appropriate to make simple assumptions about politics and then construct more short-range projections. They had not thought that their role might be to construct alternative projects and programs, particularly policies different from those generated in the Korean Development Institute (KDI), since KAIS had access to huge amounts of information not available to economists. If they did not accept the role, some institution similar to KAIS would have to take on the task.

They asked how one educates a person for the task of planning for science, technology, and social development. Oh Byungho described how it was done for urban development at MIT at present, and I added a few comments upon the strategy employed in graduate school education at Berkeley, which draws heavily upon peer group instruction rather than professorial authority. This was obviously very different from conditions experienced when they were in graduate school in America six to fifteen years ago.

Evaluation

KIST has found a niche for itself in Korea as an analog of the Battelle, Stanford Research Institute, and Arthur D. Little organizations. Enough Koreans had participated in that category of research to see the role quite clearly, and establish themselves in it. Battelle's influence in the early stages of KIST was crucial.

KAIS does not seem to have found as yet the kind of place in the society that fits the intellectual capabilities and self-image of the members. The policy roles played by leading scientists from MIT, Chicago, Berkeley, Stanford, and Cal Tech, as well as Lockheed, Boeing, IBM, and other space age firms, were not comprehended by the Asian members of the laboratory. Scientists at the level of the Korean participants in America almost unanimously disapproved of policy-oriented activity when taken up by laboratory directors and independent spirits, such as Linus Pauling--unless the effort was directly aimed at getting money for the group. No other organization in Korea can become the voice of scientific and technological reasoning, yet so far the members of KAIS are unable to identify an individual spokesman, nor is there a team developing. In that sense Korea is still behind Taiwan, Singapore, India and Pakistan.