

JAPAN — THE EMERGING SUPERSTATE ? — Some Thoughts on Herman Kahn —

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JAPAN'S EMERGENCE FROM an isolated poor Asian island state in the late nineteenth century to a highly industrialized giant in the postwar years of the twentieth century is a well-known story in both the academic and lay worlds. With the emergence of Japan as the second largest industrial power amongst the non-Communist countries of the world, it is the likely future course of Japan's development that is increasingly attracting the attention of the world. But few social scientists are bold enough to predict the course of future long-term development of Japan. Herman Kahn, a founder and a director of the Hudson Institute, in his book, *The Emerging Japanese Superstate*, makes the bold prediction which he has stated as follows:

As mentioned earlier, if I had to choose a best estimate, I would choose the medium one. In that scenario Japan probably passes the United States in per capita income around 1990 and probably equals the U.S. in Gross National Product by about the year 2000. [2, p. 130]

Forecasts of the likely course of economic development of a country are at best informed guesses, particularly when the country concerned is closely linked to the world through foreign trade as Japan is. The future course of development of Japan is dependent not only on the interaction of sociopolitical and economic factors, including technological development, within Japan, but also on the interaction of these factors with sociopolitical and economic forces in the world—more particularly in the Asian-Pacific region. Kahn's book was published in 1971, before the "Nixon shocks." The first "shock" created by imposing a surcharge on imports was intended to bring about a realignment of the structure of world exchange rates by up valuation of the yen and devaluation of the U.S. dollar. Recognition of China by the United States was the second "shock" and was intended to bring about a change in the world balance of power by undermining the bipolar balance that has persisted since the Second World War. These post-1971 developments rekindle curiosity and interest of students of world political economy in Japan's likely future path of development.

A. *Cultural Outlook, Social Organization, and Growth*

A considerable part of the book has been devoted to the author's observations on Japanese attitudes, ways of thinking, and social and business institutions, all of which are said to be important contributory factors determining Japan's high growth rates. As is well known, Japan has a traditional culture which has had

a continuous development dating back to a millenium or more, but without much direct influence from other cultures through the penetration of aliens by means of trade or war. In this respect, Japan's culture is different from most other Asian cultures. Japan was opened to widespread direct influence of other cultures only after the visit of Admiral Perry in 1868, when as the author points out, the Japanese when confronted by a superior force, shrewdly agreed to open their country for trade with the West. The subsequent "Westernization" of Japan under the Meiji restoration is a well-known story. In retrospect however, it would seem that "Westernization" consisted mainly of the dissemination of the science and technology of the West amongst the Japanese. Japanese attitudes continued to be conditioned largely within the mould of the traditional culture, and this has been an important influence determining Japan's economic growth. On this cultural aspect, the author confines himself largely to a series of quotations from the book *The Chrysanthemum and the Sword* by Ruth Benedict. It is doubtful as to whether the author is competent to come to any conclusion with regard to the cultural factors that have had an important bearing on Japan's economic development. Nevertheless, we can say that the author has very rightly focused attention on what may be considered to be a vital influence that has governed Japan's economic growth.

Perhaps the most striking feature of the postwar economic scene has been the paradoxically rapid recovery and growth of the war-ravaged economies of Germany and Japan. Of these "miracles," it is the Japanese recovery and growth that has attracted the most attention, because prior to the Second World War, Germany was already the world's third largest industrial power. The consistently high growth rates achieved by Japan in the postwar years, and the acceleration of the rate of growth in the 1960s, demonstrated the potential to achieve high growth rates by the pursuit of correct development strategies in the context of a market economy. Prior to the Japanese achievement, the Soviet Union was an outstanding example of a totally state controlled and directed economy in which high growth rates were achieved through economic planning. In fact, the high growth rates achieved by the Soviet Union, the countries of Eastern Europe, and China induced many economists to think that rapid rates of growth were possible only in countries which embark on total state planning and control of their economies. The consistently high growth rates achieved by Japan in the postwar years proved to be even higher than the rates achieved by these state directed and controlled economies. Hence, the great interest of economists in the Japanese experience as a demonstration of the potential to achieve consistently high rates of growth without total state ownership and control of the economy. There would, however, seem to be a common link in the high growth rates achieved under the two opposed models as exemplified by the Soviet Union and Japan. The high growth rates achieved in the Soviet Union in the 1930s and in other Communist countries in the early postwar years was to a great extent accounted for by the successful mobilization of mass enthusiasm in the implementation of a planned program of development. In Japan too, the explanation of consistently high growth rates would seem to lie

in the successful mobilization of mass enthusiasm while implementing development strategies designed to maximize the rate of economic growth within the context of a market economy. In contrast to the example of Communist countries however, Japan has been able to maintain this mass enthusiasm over a longer period perhaps because she was able to increase mass consumption while accelerating the rate of growth. From the author's exposition, it would appear that this successful mobilization of mass enthusiasm in Japan was greatly helped by the collective attitude of the Japanese in arriving at important decisions in business and in government. This collective attitude manifested itself in certain institutional forms and in conventions and customary practices which were observed in the market for labor, in contrast to the institutions, conventions, and practices which are said to be a pre-condition for maximum efficiency in the traditional free market model. For example, the lifetime employment system greatly retarded labor mobility in the advanced sector of the economy. Promotion in large firms was determined almost exclusively by seniority. In management, as the author puts it, the system of decision-making was "group centered," involving the participation of a large number of executives in decision-making which tended to be by prior agreement amongst the participants in the process rather than by direction from the top. The life-employment and the group-centered decision-making systems, it must be noted, are more oriented to the organization of community action than the exercise of individual initiative. When compared with the standard Western free enterprise model therefore, Japan as a successful free enterprise economy presents a paradox. It is not irrelevant in this context, to draw attention to the generally unostentatious nature of Japanese living even amongst the wealthy classes. Unostentatious living is an important psychological factor that is also likely to have moderated class antagonisms which unavoidably develop with the growth of an economy under free enterprise.

It must be emphasized that this system of employment and management is an integral part of the Japanese culture which is based on a system of values that differs widely from the American or West European. The Japanese value system is closer to those of other Asian countries, particularly China, from which she has derived a great part of her cultural heritage. Yet, it is well to remember that the Japanese culture evolved in far greater isolation from other cultures than was true of almost any other Asian country. The author also emphasizes the unusual racial and cultural unity of the Japanese as a factor that has helped her to achieve rapid economic growth. The author himself points out however, that this unity may not necessarily continue to operate in favor of rapid growth. For example, the influx of immigrant labor is not likely to be encouraged, despite the likely acceleration of wage rates with the emergence of a short supply of labor. This can be a factor that will retard the continued growth of the Japanese economy.

B. *Definition*

A question that must be asked at the outset is as to what the author means by the use of the word "superstate" to describe the future Japan. It is therefore

useful to quote below the author's definition, if it may be called as such, of the word superstate as used in this book.

The title *The Emerging Japanese Superstate: Challenge and Response* has been chosen with some care to describe as precisely as possible the subject matter of this book. By using the term "superstate" I have tried to preclude a prejudgment about whether Japan will become only an economic, technological, and financial giant and retain its current "low posture" in international affairs, or whether it will also become at least a financial superpower and seek—or develop—"super" political and/or military power or influence. Indeed it is possible that the Japan of the future may find a role that compromises these factors of power or that exerts them in new ways and in different areas of the world. [2, p. vii]

It is evident that the author intends to use the word in an unconventional sense. Yet, in the next paragraph of this note quoted below, he indicates that the future course of Japan's development is likely to be more conventional than implied in this neutral definition of the word superstate.

I do believe, and argue in this book, that in the next decade or two Japan almost inevitably will achieve giant economic, technological, and financial stature, that very likely it will become financially and politically powerful in international affairs, and that eventually it is likely to strive to become a military superpower as well. In addition, I take account of some—but only a few of—the possible aesthetic, artistic, and cultural aspects of Japan's future—issues of the "quality of life" and of what is now often called "meaning and purpose" particularly as these are affected by the onset of "post-industrial culture." [2, p. vii]

The author's concept of a superstate is very much related to the growth of the GNP and its disposition by Japan to achieve national objectives, than to any other criterion such as the evolution of a new socioeconomic system rejecting the traditional Western concepts of progress. Even if we accept the author's prediction with regard to Japan's GNP, it is difficult to conceive of Japan becoming a power comparable for example, with the United States, the Soviet Union, or even China. The difference arises basically from the differences in natural resource endowment between these countries and Japan. Because of the lack of natural resources, Japan is far more dependent on foreign trade as a means of securing fuel and vital raw materials required for industrial production. Currently, Japan has to import almost all her requirements of fuel and iron ore, and the major proportion of her requirements of non-ferrous metal ores. Besides, unlike the United States, USSR, and China, Japan has no known reserves of fuel, ferrous, and essential non-ferrous ores of any consequence; the United States and the Soviet Union have enormous reserves of fuel and vital raw materials buried in and around her which can be exploited with the continued development in technology. China's reserves are also likely to be considerable though not much information is available on their locations and extents. The importance of this relationship between natural resource endowment and the capacity to produce manufactured goods, raw materials and foodstuffs for disbursement amongst nations, on what are generally called "soft terms" today, has not been touched upon by the author. It must not be overlooked that the exercise of

global political economic power by the United States since the Second World War, has also been greatly determined by her ability to expand agricultural production to meet increasing demand arising from increasing world population, and to meet shortfalls in crop arising from natural disasters such as droughts or floods in major producing countries. Even in respect of food production, Japan's capacity is greatly circumscribed by an unfavorable land/man ratio—only 16 per cent of Japan's total area is cultivable as compared with 34 per cent for the United States which is twenty-one times larger than Japan. Surely, it is the exploitation and development of this relationship between resource endowment and the capacity to produce goods and services that has made it possible for the United States to become a global superpower exercising influence in almost every country of the world, not excluding the European and Asian Communist countries? It is difficult to envisage Japan as a power comparable with the United States or the Soviet Union and even China, if she has to continue to depend as heavily as now on imported fuel and vital raw materials. It can be argued that even if Japan does not have a natural resource endowment comparable to that of the United States, there is nothing to prevent her providing an enormous volume of goods and services on soft terms through the achievement of surpluses in her balance of payments. Nevertheless, the distinction is valid. The ability of Japan to provide "aid" on soft terms will be very greatly dependent on her trading terms which are not within her control to the extent that trading terms of internal resources are.

The author's failure to explore the relationship between resource endowment and superpower status has made him overlook a consideration of vital importance for the future. If the Japanese economy continues to grow rapidly in the future while being dependent on imported fuel and raw materials, is it not likely that internal forces will increasingly give an "imperialistic" orientation to her foreign policies? Modern imperialism is a far cry from the old type colonialism. Yet, it cannot be denied that wealthy nations do try to secure their sources of fuel and raw materials, and also try to obtain them on advantageous terms—as has been demonstrated in recent times by the countries associated in OPEC which have compelled the major importing countries to pay higher prices for oil. At the same time, the aid these creditor nations give to dependent underdeveloped countries from which they often obtain their requirements of raw materials, may be more advantageous to the creditor than the debtor, from the point of view of economic development. This new "imperialism" which may be manifested by both capitalist and socialist superpowers unlike the imperialism of the past, has been loosely described as neo-colonialism and is increasingly likely to be an influence in Asian and international politics. Hence, the importance of Japan's fuel and natural resources development policies for the future of the Asian region and also for the world at large.

C. *Methodology*

The author's methodological approach to forecasting the future growth of the Japanese economy is revealed by the following excerpt:

In this enterprise of trying to estimate future Japanese growth rates, one can choose among several techniques. For example, one can do various kinds of input-output type studies, trying to identify where bottlenecks or other difficulties would occur and to assess whether the Japanese might be able to circumvent them. We have done this several times at Hudson Institute, though admittedly not in a very thorough or deep manner. In fact, we do not have particular faith in such calculations and do not feel justified in allocating major resources to them. Rather, we use such calculations to check and discipline conclusions arrived at through other means. The most important of these is quite simple: to examine the Japanese society and economy today, its internal and external environment, in order to identify qualitative and quantitative reasons for the economy's very high growth rate, and then ask to what degree these seem likely to persist in the future. We find very persuasive our current conclusion to such an analysis—that high Japanese growth rates, rates in the neighborhood of 8–12 per cent or so, are likely to continue for most or all of the 1970–1980 period and perhaps beyond. Among the many positive qualitative-quantitative reasons for this growth to continue are the following. . . . [2, p. 101]

The methodological approach of the author is eclectic, which is perhaps the correct approach to forecasting the long-term future economic development of a country. The use of sophisticated model building techniques are hardly likely to make such predictions more accurate. The author's assumptions however, can be criticized, in particular the general overall assumption that the internal and external environment for Japan is likely to favor high growth rates in the future. It is increasingly likely that the persistence of a favorable internal and external environment is dependent on the policies that are likely to be pursued by Japan herself. A more fundamental drawback of the exposition of the author, directly connected with the question of Japan's own policies, is the implicit assumption of a given technology. Up to now, the rapid advancement of Japan's economy has been directly connected with the borrowing of the advanced technology of the West. As a broad generalization, it would not be inaccurate to say that available Western technology reflects the resource endowments of these countries, i.e., the United States, Canada, United Kingdom, Germany, France, Italy, etc. These countries are relatively well endowed with terrestrial sources of fuel and vital minerals, as compared with Japan. Hence, the continued exploitation of this technology implies continued dependence of Japan on the import of these fuels and essential raw materials. It is not inconceivable however, that in the future the growth of the Japanese economy will be more connected with the indigenous development of a technology which is more in accordance with Japan's factor endowment—an aspect which is elaborated on subsequently in this review.

D. *Basis of Prediction*

The basic proposition underlying the author's prediction is stated as follows:

The first and possibly the most essential factor in my argument—though by itself certainly not sufficient explanation for Japanese growth rates—is Japan's high saving and investment rates, which guarantee there will continue to be, both relatively and absolutely, enormous resources available for expansion. In recent years the Japanese have tended to save and invest about one-third or more of their gross national product. This is the highest rate in the world (except for Kuwait's, which is technically higher—but that is a very special case indeed). Thus the Japanese today

save proportionately about one-and-one-half to three times as much as the European and North American nations do. [2, pp. 102-3]

The author has overlooked the fact that an unusually high ratio of savings to GNP can itself be a function of the rate of growth rather than the other way round. This inference follows from the fact that in the short run, household consumption is determined more by custom and habit rather than the level of income itself. Keynes in his *The General Theory of Interest, Employment and Money*, has made the penetrating observation that when the income of an individual increases, consumption also increases but not by as much as the increase in income. Keynes reasoned that people do not increase their consumption immediately, because consumption is greatly determined by custom and habit. It would appear that the Japanese people when confronted with a rapid increase in personal incomes are not increasing their consumption as rapidly, because their consumption continues to be predominantly determined by previously acquired customs and habits. Significantly, this unusually high rate of savings in Japan is accounted for mainly by an unusually high rate of savings in the household sector whereas corporate and government savings in Japan are not unusually high as compared with the advanced countries of the Western world. Hence, the high rate of Japanese savings can be said to be itself a reflection of the high rate of growth. Therefore, to postulate at this stage of Japan's development that the high rate of savings, and hence of investment, is an independent variable determining Japan's continued rapid growth in the future, is to indulge in circular reasoning.

E. *Foreign Trade*

Kahn does not think that foreign trade is likely to become a significant constraint on Japan's continued economic growth. His conclusion on the question of foreign trade is quoted below:

The fifth point has to do with foreign trade. If the Japanese triple their economy in the next decade or so their foreign trade will probably be about 10 per cent of world foreign trade (as opposed to the current 6 or 7 per cent). While 10 per cent begins to press pretty hard, it does not seem an absurd percentage to expect the Japanese to attain particularly if about half of this 10 per cent is in trade with Non-Communist Pacific Asia. [2, p. 97]

The relative importance of foreign trade in the economic structure of Japan as compared with the economies of the United States, West Germany, and the United Kingdom in the year 1970, is shown in the table below:

Country	Percentage of Exports to GNP (Current Prices)	Percentage of Exports to Total World Exports (Current Prices)
United States	4.4	15.3
Japan	10.3	6.9
West Germany	17.2	12.3
United Kingdom	16.0	6.9

It is observed that the proportion of Japan's exports to GNP is much less than the proportions of West Germany and the United Kingdom. From the point of view of natural resource endowment, however, Japan's economy is even more dependent on imported fuel and raw materials than West Germany and the United Kingdom. Hence, if per capita income in Japan is to equal that of the United States by about 1990 as anticipated by the author, we can expect the ratios of Japan's imports and exports to GNP, to increase. It is not likely however, that Japan's imports will increase as rapidly as her exports because an increasing proportion of Japan's exports is likely to consist of products embodying high added value. Hence, unlike in the past, Japan's growth itself is not likely to generate an adequate reciprocal demand for imports unless deliberate policy action is initiated to achieve this end.

A major problem facing Japan is that her export trade is concentrated in the more advanced countries, while much of her imports of essential raw materials are drawn from many of the less advanced countries which are however, unable to absorb Japanese exports adequately because of low income levels and foreign exchange problems. From hindsight we are aware that Japan is already experiencing difficulties with her major trading partner, the United States. The author however, has anticipated this problem. He observes as follows:

But one future problem has already reared its head—the Japanese will have too favorable a balance of payment and thus cause a currency drain in their trading partner. It is clear that the Japanese must not allow their favorable balance of payments to grow, and they might, for example, have to reevaluate the yen (which would simply mean their having to work less hard for their imports). Doubtless that will be done in the next decade or two, but not immediately. [2, p. 117]

It is unfair to criticize the author from hindsight for failing to anticipate the problems connected with the weakness of the U.S. dollar, which has resulted in two major realignments of exchange rates of major trading countries, including Japan. Nevertheless, Kahn may be justifiably criticized for failing to see the basic contradiction in the commitment of political leaders to free trade and to the maintenance of full employment. While it is true that political leaders in many advanced industrial countries are committed to free trade, we cannot overlook the electoral constraints within which politicians have to work in furthering free trade. Thus, while advocating free trade they also accept that the achievement and maintenance of full employment is equally, if not more desirable. It is a serious omission on the part of the author to have overlooked this conflict between a commitment to free trade which reflects an underlying commitment to an international economic system, and the commitment to full employment which reflects a commitment to the national economy. Yet, Japan's ability to expand her exports to the United States and the other developed countries of the Western world is crucial to her future development. Japan's role in Asian economic development is greatly dependent on her ability to give aid and sponsor private foreign investment in this region—an ability that will be vitally determined by her export surpluses.

It is not only from the export side however, that trade is likely to become a

constraint on Japan's future growth. Another consideration that has been left out of Kahn's calculations is the fact that the fuel, ferrous, and non-ferrous mining industries of the world are dominated by giant multinational and national corporations, which are increasingly becoming government owned or controlled. It is possible for these corporations to influence export prices of these fuels and raw materials through cartelization, open or tacit collusion, etc. Governments of countries in which these raw materials are mined can also exert pressure to revise prices upwards. It must also not be overlooked that some of these countries afford considerable export markets for Japanese manufacturers and therefore, are in a doubly advantageous position to exert pressure. It may be argued however, that Japan herself has a considerable countervailing power as it provides a large market for these raw materials. It is yet doubtful to what extent such countervailing power can be effective, particularly after Japan has created her expanded industrial capacity which would require both imports and exports to keep it going. The upward pressure exerted on petroleum prices by the oil producing countries, predominantly of the Middle East, associated in OPEC, is a case in point. Japan does not have alternate sources of domestic supply such as the Alaskan oil deposits or the coal deposits of eastern and southwestern U.S.A., the development of which offers the United States a feasible alternative to the payment of higher prices for imports. The degree of countervailing power that can be exercised by Japan will therefore be limited, not only in respect of fuel, but also with regard to supplies of other minerals of which she has hardly any reserves. It is possible for Japanese companies to increase their overseas investments in mining ventures, and thereby to some extent at least, secure their sources of supply as indeed they have been doing in the recent past. Yet, in considering the future, we must not overlook the pressures that can be exerted by the emergence of assertive nationalism in countries in which such investments are made. Such pressures can be expected particularly in the Middle Eastern, Asian, and Australasian regions where nationalism is a relatively new force and from where Japan draws the major proportion of her fuel and raw materials.

F. *Labor Supply*

Labor supply is also likely to be an increasingly important factor governing Japan's foreign trade. The age composition of Japan's population which favored postwar growth because of the relatively high proportion of young people, is now tending to affect the labor supply adversely with the increase in the proportion of old people, reflecting the severe decline in the birth rate in the postwar era. With the absorption of the underemployed labor from the less advanced sectors of the economy, the labor market has increasingly shown a situation in which the number of job vacancies far outrun the available supply. Significantly, the emergence of this relationship has been accompanied by a situation in which wage rates have tended to increase faster than productivity in the manufacturing industry, in which sector of the economy productivity gains have been highest in the past. Diversion of agricultural labor to industry has been slow, despite special efforts by the government to encourage the consolidation of land. A

characteristic of Japanese agriculture is the dominance of very small farms. With rapid industrialization, part of the family labor of most farm units have taken to non-farm employment on a full-time or part-time basis. Yet, the continued maintenance of high support prices for rice has retarded labor mobility between agriculture and industry. An obvious policy measure that would ease the labor supply situation is a reduction in support prices for agriculture. This is however, not politically feasible. Nor can it be said to be necessarily in Japan's long-term interest because it will increase her dependence on imports of basic foodstuffs.

As the author points out, the cultural homogeneity of the Japanese makes it unlikely that as a nation they will countenance the influx of foreigners to ease the supply as has been done in many countries of Western Europe. Hence, the escalation of costs resulting from the enhanced bargaining power of labor, cannot be ruled out. Again, the author points out that Japan can make good this disadvantage arising from tightness in the supply of labor by the employment of married Japanese women who have, by and large, stayed out of the labor market thus far, and also by the pursuit of correct foreign investment policies designed to make use of the unemployed and underemployed labor of Pacific Asia. While we can agree with the author that these are distinctly possible developments, we must not overlook the fact that the increased import of labor-intensive goods produced in the highly populated countries of Asia will increase the dependence of Japan on imports.

G. *Conclusion on Foreign Trade and Growth*

It may be concluded from the foregoing discussion that if as envisaged by the author, Japan develops an economy approaching in size that of the United States, using the basic economic strategies and concomitant economic policies pursued by Japan in the postwar period, foreign trade is likely to become a major problem, if not a bottleneck. With the continued increase in her foreign trade, and also her foreign investment, Japan is likely to be driven to acquire a conventional sea-based military force to protect her vital interests. The precursors to such a development are already evident—as for example, the announced intention of Malaysia and Indonesia to ban the Straits of Malacca to the passage of the goliath oil tankers so vital to the supply of Japan's energy needs. The proposed alternative route of the Kra Canal across southern Thailand will not solve the problem; Japan will still be confronted with the necessity to safeguard her supply lines. Should Japan acquire such a military force, however, she will be opening herself to the charge of having become a neo-colonialist power, reviving memories of her unsavory imperialist policies of the past. In the context of the curious mixture of nationalism and ideology that is tending to dominate Asian politics, such a development would be to the distinct disadvantage of Japan.

It would seem therefore that in the foreseeable future, the rate of growth of the Japanese economy is likely to be retarded by the problems arising from the necessity to continue the increase in her foreign trade, in contrast to the previous decade when foreign trade helped to advance the rate of growth. The rapid increase in foreign trade contributed directly to the achievement of high growth

rates in the postwar years by providing the foreign exchange to finance Japan's increasing requirements of fuel and essential raw materials. Indirectly, foreign trade helped Japan to maximize the rate of growth in two ways. Firstly, it helped her to maximize the output/capital ratio by investing in plant and machinery with much larger capacities than warranted by the size of the domestic market, exploiting the technological developments of the advanced countries of America and Europe. Secondly, exports helped her to utilize installed capacities more fully in counter to fluctuations in domestic demand. In fact, foreign trade was a dynamic influence on Japan's growth, and its impact is not readily quantifiable. Besides, if as argued above, the high rate of savings is significantly determined by the high rate of growth itself, foreign trade is likely to be a far more important factor determining Japan's future growth than would appear from the importance of imports, and hence of exports to pay for imports, in Japan's industrial structure.

H. *Alternative Growth Strategy*

The failure of the author to explore the relationship between natural resource endowment and technological development in the emergence of Japan as a superstate is a major weakness of the book. It is the changing relationships between three key variables of natural resource endowment, foreign trade, and the labor supply that are likely to be the vital influences guiding Japan's future technological progress, which in turn may well become the most dynamic influence governing and shaping her future economic development. Since technological progress can be, and is likely to be greatly influenced by conscious policy decisions of government such as the allocation of expenditure on education and research, exploration of the alternatives open to Japan in the long term in overcoming her poor natural resource endowment is likely to be a fruitful line of approach in speculating on Japan's future economic progress. For example, it may be possible for Japan to overcome the limitations of natural resource endowment by developing technology for obtaining her requirements of fuel and essential raw materials from the seas and oceans around her. Alternately or concurrently, she could try to find new sources of power by developing the technology of geothermal energy as against the alternative of nuclear power. She could also try to develop the technology of new materials to find substitutes for the traditional materials which forms the basis of modern civilization.

There is an alternative strategy of development from the conventional open to Japan to pursue in the long term, that has not been touched upon by Kahn—the development of technology to explore and exploit undersea mineral resources, to engage in large-scale fish farming and the sub-surface cultivation of marine plants for food as well as a basis of an extractive industry. Thereby, Japan may become self-sufficient in fuel resources, some essential foods and even some vital minerals. In this context, the discovery of natural gas and oil in the North Sea and its rapid exploitation by the United Kingdom, is an illustration of the possibility. It is anticipated that by 1980, the United Kingdom will be receiving adequate oil to meet approximately half her requirements of this fuel. It is also

envisaged that in the not too distant future, the United Kingdom will become completely self-sufficient in oil. Besides, she is already receiving an adequate volume of natural gas from these fields to do away with the gasification of coal. While it is true that no oil deposits have thus far been found in the sea in close proximity to Japan, to the north of the relatively shallow sea of Japan oil is drilled in the island of Sakhalin which forms part of the Soviet Union. To the south, in the East China Sea, oil has recently been discovered in the Senkaku Group of islands, the ownership of which is disputed by Japan, Taiwan, and China.

Deep sea or benthic deposits of minerals are known to exist. The problem is the development of technology to exploit these reserves. As in the case of oil, it is only rising costs with the exhaustion of the more readily exploitable reserves that is likely to spur the commercial development of the required technology. Unfortunately, benthic reserves are mostly found at great depths. U.S. exploration has revealed extensive benthic deposits of potato-shaped accretions (benthic nodules) of the four metals, cobalt, nickel, copper, and manganese on the surface of the sea floor, about one thousand miles off the U.S. West Coast—particularly in the deep trenches at depths of about three miles. These deposits are thought to be commercially exploitable, by means of dredgers specially designed for the purpose.

Sea water contains forty elements which includes common and rare metals. Metals in solution in sea water include iron, aluminium, copper, zinc, nickel, gold, vanadium, radium, etc. It is certainly not a feasible economic proposition to extract the minute quantities of any of these metals by direct treatment of sea water. But there are alternate and indirect ways of doing this by harnessing nature. Philippe Diolé in his book, *The Undersea Adventure*, observes as follows regarding the possible use of seaweeds for extraction of minerals from sea water.

A use for seaweed in industry has still to be found. It is quite impossible for the existing natural species to yield satisfactory results. No plant has ever presented man with riches enough to justify its intensive exploitation at the first attempt. Selection, cultivation and cross-breeding may gradually diminish the large content of water and increase the residue of algine, iodine and other products. This is a matter for botanists. In 1855, Thuret began to cultivate seaweed artificially and produced the first cross-breeding achieved by man.

Today we are far better equipped to apply the laws of genetics and exploit the profitable content of vegetable matter.

The example of the sugar beet is eloquent in this context. In its wild state beetroot is a coastal plant (*Beta maritima*) with a thin, woody root. In less than a century it has become a plant whose sugar content has more than trebled. In 1884, it was 5.5 per cent; today the Vilmorin beetroot yields 18 per cent. From an industrial point of view it is well to observe that the first sugar refinery in France, created by Napoleon, only dates from 1812, though the presence of sugar beetroot had been known since 1605. This one example shows that attempts to make use of plants on land have sometimes been slow, and have generally resulted in their complete transformation. The same will no doubt hold good for the produce of the sea. [1, p. 149]

Indeed, it was the high concentration of iodine absorbed by the variety of

seaweed known as *Laminariae* that has enabled its economic extraction. Philippe Diolé makes a telling point. It is because man has not used his ingenuity to breed the seaweeds with the capacity to concentrate the mineral constituents of sea water that this potential source of supply lies untapped.

Japan has been foremost amongst nations which have exploited international waters for fishing, reflecting the fact that the major source of proteins in the Japanese diet is fish. Japan is also foremost amongst nations in the field of marine farming, including the breeding of fish and the cultivation of seaweeds which are a standard item in the Japanese diet. Perhaps the most widely known achievement of Japanese marine biology is the raising of cultured pearls by Mikimoto, who developed the technique of wrapping a minute piece of mother-of-pearl with pearl oyster flesh and then grafting it inside a live pearl oyster. The oyster coats this irritant with its secretions, creating a fine pearl comparable with the natural one. Yet, Japan has hardly realized a fraction of the potential in this field. As an indication of the potential, Philippe Diolé points out that a single female turbot lays 10 million eggs in its natural habitat in which only a fraction of the fishlings hatched survive in an environment fraught with hazards and frequented by predators. And in the context of the advances in the science of genetics, it is not farfetched to think that as envisaged by Philippe Diolé, it is possible to evolve succulent varieties of seaweeds for food and alternative varieties for the economic extraction of the rarer metals.

The potential of the resources man can obtain from the sea is only now being realized. Though the sea occupies over 70 per cent of the surface of the globe, man has paid scant attention to undersea exploration, and the development of technology to exploit its resources. It has often been pointed out by social scientists that on the sea, man continues to be a hunter, even though on land he had long ago progressed to domestication and breeding of animals and the cultivation of crops. This is more a reflection of a lack of interest amongst nations in exploiting the resources of the sea, rather than insuperable technical difficulties. Up to about the Second World War, the basic research that forms the basis of technological development was generally left to the initiative of brilliant scientists, often working against odds with improvised equipment. Sadly, it is the direction of research to further the war effort that showed man the potential to harness science and technological progress to achieve specific national objectives. Outstanding examples of the achievement of specific technological objectives by research and development are the V2 rockets built in Hitler's Germany, the atom bomb in the United States, and subsequently, the launching of an unmanned space satellite by the USSR, and the landing of a man on the moon by the United States. All these projects called not only for the application of adequate resources to achieve these specific objectives, they also called for the co-ordination of the efforts of a large number of scientists, technologists, and other workers. For example, the U.S. effort to land a man on the moon involved the co-ordination of the efforts and activities of three hundred thousand people. It is a reflection of man's ingenuity that the management aspect of co-ordinating

the activities of so large a number of people, in keeping with a set timetable, was successfully overcome.

Commercial exploitation of marine resources are overwhelmingly determined by considerations of price and profitability. In the case of oil, undersea exploration and exploitation has been greatly determined by the exhaustion of the more accessible reserves and the consequent increases in prices. More recently, the monopoly control of sources of supply by a small group of producing countries has given a further impetus. Today, social scientists accept that there is a vital link between state-directed research and the advance of technology in desired directions. It is unlikely that private commercial interests in Japan will devote sufficient resources to undertake the basic research that is essential as a preliminary to the exploitation of the seas and oceans around Japan as a source for her requirements of fuels, foodstuffs, and raw materials. It is clearly a responsibility that devolves on the government. This means that the government will have to channel a considerable volume of funds to research and development in oceanography and undersea technology.

Conclusion

Kahn should be given credit for his perception of the dynamic impulses working within Japanese society, that have propelled Japan to the verge of big power status. The book itself embodies research and study of the author at the Hudson Institute over a period of years in the mid-1960s. He was amongst the earliest to perceive the fact that Japan's economic growth was not a reflection of external stimuli such as the U.S. military expenditure on the Korean and Vietnam wars, but a reflection of dynamic forces unleashed within Japan. The continued high growth and the record balance of payments surpluses achieved by Japan in the face of the first yen revaluation can be considered to be a vindication of the author's prognostications with regard to Japan's economic progress in the short-run future. We must not overlook the fact, however, that this dynamism cannot be sustained at the same tempo if external factors become more adverse, as indeed they have become, in the form of a second revaluation resulting from the floating of the yen. Besides, the erection of non-tariff and even tariff barriers to limit Japanese exports in some of her larger markets, cannot be overruled. As pointed out earlier in this review, the author has overlooked the basic contradiction between the commitment of the leaders of the advanced nations of the world to free trade, and their electoral commitments to full employment. The author has also failed to take into account the potential for the exercise of monopoly power by multinational corporations and governments of countries in controlling the sources of supply of fuel and vital raw materials. We cannot therefore agree with the author that Japan will have "adequate access—on good and perhaps improving terms—to most world resources and markets" [2, p. 102]. Hence, if Japan is to continue to progress rapidly in the long term, without undue dependence on the goodwill of other nations, it would seem that she will have to take steps to reduce her dependence on the imports of fuel and essential raw materials, and also moderate the trend towards an increasing foreign trade. As pointed out

in this review, this involves a conscious direction of technology to achieve this end. This may imply a slower rate of growth in the longer term than anticipated by the author. It must also not be overlooked that the pursuit of a policy to merely maximize GNP in the short run may well prove to be self-defeating. As was pointed out at the outset of this review, it would appear that the system of social organization in Japan favored the generation of mass enthusiasm to increase production and improve productivity, notwithstanding the context of a capitalist system of organization of production. It is doubtful that the mere achievement of a high growth rate will necessarily continue to help in the mobilization of mass enthusiasm. Continuance of this enthusiasm is likely to be very much dependent on the socioeconomic policies that the government will pursue. Perhaps a policy that would appeal to the Japanese people in the future, is one designed to ensure their continued enjoyment of improving living standards including an improved environment, but without being too dependent on the goodwill of other nations, and also without the necessity to resort to the creation of large military forces having the overtones of the old imperial tradition. Kahn, in assuming a given technology, has failed to explore the possibilities open to Japan to develop a new technology which will enable her to pursue alternative strategies, both economic and political.

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