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19 August 1980

Japan Report

(FOUO 19/80)

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19 August 1980

JAPAN REPORT

(FOUO 19/80)

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POLITICAL AND SOCIOLOGICAL

'MAINICHI' CRITICIZES FOREIGN MINISTRY

Tokyo MAINICHI DAILY NEWS in English 30 Jul 80 p 2

[Editorial: "'Gaimusho' Without Policy"]

[Text]

The Foreign Ministry recently published a report by the Committee on Peace and Security in an attempt to pinpoint Japan's security problems from the global standpoint. The report, however, has not only disappointed us but caused us to entertain grave anxiety as to the future course of this country.

In the first place, the report emphasized the importance of military might in the conduct of diplomacy while proposing an amendment to the keynote of Japan's postwar foreign policy, namely, "peace diplomacy without resorting to arms."

There is little doubt that military might has been playing a major role in international politics, and that the increased Soviet military strength is partly responsible for the escalation of tension. The Soviet Union has expanded its military capability to an alarming degree, thus threatening to upset the power balance with the United States. As a countermeasure, the U.S. has called on Japan and its allies to step up their defense posture.

Notwithstanding our analysis of the present situation, we doubt whether the imbalance between the military and nonmilitary aspects of Japan's security, as the report implied, poses a serious problem. It is desirable that the nation should engage in intensive discussions on the security issue, but it must be remembered that Japan's diplomacy started off with the conviction not to have military might.

The Foreign Ministry appears to have set aside the very basic spirit of Japan's diplomacy judging

from the report, which contended that it will be difficult to maintain security in the 1980s without a military backup.

The report was quite enthusiastic about strengthening Japan's defense capability, expanding its solidarity with the U.S. and western Europe, and restraining Soviet military power. On the other hand, it failed to iron out any concrete measures designed to promote dialogue with the Soviet Union and ease the tension.

We learned a bitter lesson in the days of the cold war that increased military might only gives rise to endless military expansion and escalation of tension. We should not repeat the follies of the cold war caused by the arms race, and we remind the Foreign Ministry of the principle of Japan's "peace diplomacy without military might." /

CSO: 4120

POLITICAL AND SOCIOLOGICAL

ELECTION SYSTEM ANALYZED

Tokyo MAINICHI DAILY NEWS in English 30 Jul 80 p 4

["NAGATACHO DOINGS" column by Takehiko Takahashi, adviser to the MAINICHI newspaper and former chief editorial writer: "Small Constituency System"]

[Text]

When he attended a meeting of directors of the House of Representatives' Diet Operation Committee on July 22, Chief Cabinet Secretary Kiichi Miyazawa emphasized that the government has no intention at the present time of introducing a small constituency system in the House of Representatives election.

Earlier, Home Affairs Minister Jiro Ishiba, who is in charge of election matters, had stated on an NHK TV program that "it is desirable for the House of Representatives to adopt a small constituency system and for elections to be party-managed."

The opposition parties seized upon this statement and demanded a full explanation of the government's view by calling for Chief Cabinet Secretary Miyazawa's attendance at the Diet committee meeting.

The statement that Home Affairs Minister Ishiba made on the NHK TV program had a certain background. This was that Prime Minister Zenko Suzuki made clear that a revision of the election system was planned as one of the important problems facing domestic administration, and that the Eighth Election System Study Council would be convoked shortly.

The present election system of the House of Representatives consists of medium-size constituencies. The number of seats in one constituency averages from three to five. There is a view that this election system is advantageous for the Liberal-Democratic Party. This is because the LDP is able to field several candidates in one constituency. In this respect, the system is only slightly advantageous for the Japan Socialist Party.

It is therefore considered that even if the LDP were to lose its majority, its position as the party with the comparatively largest number of Diet seats would remain unchanged under the existing system of medium-size constituencies. The late Saburo Eda, who was at one time secretary general of the JSP, remarked that "as long as the present system of medium-size constituencies continues, there is no possibility of a JSP administration being formed."

'Minus' Factors

Nevertheless, while medium-size constituencies may be that advantageous for the LDP, there are also certain "minus" factors. This is because of the intense rivalry that occurs between LDP candidates in the same constituency. This necessitates a large amount of money and also abets the formation of factions.

There has been an opinion within the LDP for some time that the only way to conduct an election that would not require a huge outlay of money and to dissolve factions is to adopt a small constituency system in which LDP candidates would not compete. An attempt was made during the Tanaka administration to bring up this problem of small constituencies, but this was not realized because of resistance by the opposition parties.

Among the opposition parties, the smaller the party, the stronger the resistance. There

is a deep-rooted view that even if a small constituency system were to be accompanied by a system of proportional representation, this would be disadvantageous for the opposition parties.

Fierce Opposition

At the time when the Tanaka administration attempted to bring up the problem of a small constituency system, the fiercest opposition was raised by Ikko Kasuga of the Democratic Socialist Party. Late one night, Kasuga, in order to avoid being discovered by newspaper reporters, climbed over a fence of the Tanaka residence in Mejiro, Tokyo, and expressed his opposition in the strongest terms to then Prime Minister Tanaka. It is said that even the resolute Tanaka was overwhelmed by Kasuga's forceful denunciation and abandoned the small constituency system.

Upon observing the last general election, if a proportional representation system had been adopted, the LDP's Diet seats would be reduced to 245. The JSP would have had 99. The Diet seats of the Komeito and Japan Communist Party would have increased. In this way an election system has a close relationship with the number of victors. Under the existing system, the relationship between the number of votes obtained and the number of Diet seats is favorable for the LDP.

Despite this, the reason why there are voices within the LDP calling strongly for a small constituency system is because of the problems attending "money" and "factions."

The DSP says that should the time come when the JSP also becomes a democratic socialist party and the two parties can combine into one, it will agree to a small constituency system—but absolutely not before that. The JCP has opposed a small constituency system since long in the past. The same holds true for the Komeito.

Accordingly, even if the LDP is holding a comfortable majority, if the Suzuki administration takes up the problem of a small constituency, great turmoil is likely to occur during Diet deliberations. Besides, there are some members of the LDP too, such as Munenori Akagi, who oppose a small constituency system.

Under these circumstances, even if the Suzuki administration convokes the Eighth Election System Study Council and a recommendation is made for a small constituency system plus a proportional representation system, it will be most difficult to put this into actual realization. *(The writer is an adviser of The Mainichi Newspapers and former chief editorial writer).*

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ECONOMIC

JAPAN'S 7-YEAR PLAN UP FOR REVIEW

OW060521 Tokyo THE JAPAN TIMES in English 5 Aug 80 p 5

[Article by Kentaro Koshiba]

[Text] The 7-Year Socio-Economic Development Plan (1979-85), which was launched with great fanfare just a year ago, is coming up for review.

The plan as it now stands calls for, among other things, non-inflationary economic growth at the average rate of 5.5 percent in the 7-year period, with domestic demand providing the main thrust of that growth.

The government is to play a large role in this through massive public investment projects designed to double the stock of the nation's "social capital," to about 240 trillion yen, a sum about equal to the present GNP.

For example:

--Public facilities related to day-to-day living, such as sewerages, waste disposal plants, parks, hospitals, schools and gyms, will be constructed in great numbers.

--The network of railways and roads also will be expanded, and so will the communications system. Envisioned, too, are big projects to build offshore airports in Tokyo and Osaka.

This public investment program, however, is expected to be scaled down, largely for fiscal reasons. The finance ministry argues that the government, now deep in deficit, simply cannot afford to achieve the 240 trillion yen target.

Officials say that public works spending will have to be increased more than 20 percent annually in the rest of the 7-year period if the target is to be attained by fiscal 1985.

Such spending was expanded 22.5 percent in fiscal 1979, the first year of the program. In the second year, however, the rate of increase dropped to zero because of the enormous budget deficit.

The 7-year plan, when it was approved by the cabinet in August 1979, was based on the assumption that the so-called "general consumption tax," a sort of value added tax (VAT), would be introduced in Fiscal 1980.

That assumption collapsed, however, as the late prime minister Masayoshi Ohira's plea for tax increases was rejected in the general election held in October of the same year. In January this year, the government officially withdrew the VAT proposal.

The possibility remains that the administration might revive the proposal in the future, though in a different form. And given the solid majority that the Liberal-Democratic Party (LDP) holds in the diet, that possibility could become a reality.

But even then it would be practically impossible to carry out the public investment program as now envisaged--for the simple reason that the tax raise would come too late.

There is another reason--one that has been cited by government economists--why the program is coming up for scrutiny that is that the role of public works spending in stimulating growth has diminished since the Japanese economy entered a period of slower expansion following the oil crisis of 1973-74.

In a time of economic slump, such spending arouses domestic demand as more building materials, such as steel and concrete, are produced to carry out public works projects. Thus it creates more jobs and thereby stimulates personal spending.

Economists at the Economic Planning Agency (EPA) think, however, that the contribution of public investment to the growth of GNP has declined in recent years--for reasons such as the following:

--An increasing proportion of investment funds is going into land acquisition, because of the skyrocketing price of land. But land purchases do not lead to creation of jobs.

--Less funds are being funneled into large-scale industrial projects, such as those to build roads and bridges, and more into small-scale projects to construct sewerages, parks and the like.

Some private economists believe that the high growth of public works spending has ended, as has the high growth of the Japanese economy itself, and that some of the projects now under government control can be taken over by private enterprises.

The finance ministry reportedly wants to see the 240 trillion yen target slashed to about 200 trillion yen, although the final figure is subject to negotiation both within the government and the LDP.

A cut in the investment program is likely to result in a slower GNP growth rate unless the slack is compensated for by an increase in private-sector demand.

What holds the key here, it is believed, is the trend of private capital spending. In other words as long as investment in the private sector remains active, the impact of reduced public investment on growth is expected to be negligible.

Also in the balance are some of the related targets to improve the "quality of life." For instance, the 7-year plan calls for increasing the availability of sewerage systems, expressed as a percentage of the population, to 55 percent in 1985 from about 30 percent now.

The plan is likely to undergo further change in 1981 and beyond not only in the areas of investment and growth but also in other key areas such as the rate of inflation (currently targeted at less than 5 percent on the average). But that seems to be the fate of any long-term plan in this age of uncertainty.

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ECONOMIC

SIGNS OF SHIFT IN GOVERNMENT'S ECONOMIC POLICY

Tokyo MAINICHI DAILY NEWS in English 26 Jul 80 p 2

[Editorial: "Economic Policy"]

[Text] Signs of a delicate shift in the government's economy management policy from that of constraining price inflation have become apparent.

Shintaro Abe, chairman of the LDP's Policy Affairs Research Council, has told business leaders that a reduction of the official discount rate has now become merely a matter of timing.

Bank of Japan Governor Haruo Maekawa has relaxed his stand somewhat on fiscal-monetary tightness by implying that the policy to be taken must be conducive to cushioning a business slowdown expected to begin in the autumn, although price stabilization should remain the top policy priority.

We firmly believe the major emphasis in economy management should be placed, as in the past, on combating inflation. This fundamental stand should not be altered under any circumstances.

The recent business performance, however, appears to call for a minor, if not significant, policy adjustment toward relaxing the government's tight grip on the economy to expand it to a certain extent, although efforts to fight inflation should not be relaxed.

The current official discount rate of 9 percent per annum, the highest level in the postwar period, is abnormally high in all considerations.

The government, in this context, is urged to begin relaxing its tight monetary policy, and as quickly as possible, provided that the economic developments, both at home and abroad, warrant the move, and provided inflation can be kept in check. The easing, however, must be carried out in a gradual manner.

Discussions on the economy management policy should deal with three major areas.

The first is the price movement. Wholesale price inflation, which had accelerated in the double-digit range in the past, appears to have peaked in April and is now abating. This leaves the question of consumer price inflation, the peak of which is yet to come. Consumer price increases, although slowed down considerably of late, are still of the utmost concern, especially when the effects of both the rapid rises of wholesale prices in earlier months and the yen's depreciating trend are considered.

We hope the government contains the consumer price growth rate during the current fiscal year within its targeted 6.4 percent compared to the previous year, lest the people's livelihood be jeopardized and all the planned economy management policies be upset.

The second concern is business performance. No one can deny the fact that a trend toward a business slowdown is emerging: production and product shipments have become sluggish, exports have slowed down, and the growth rate of consumer spending has declined. Business investments, however, have remained steady and are expected to be so in the foreseeable future. In other words, the nation's business performance is not so discouraging as to warrant an immediate relaxation of the fiscal-monetary tight policy. On the contrary, an unjustifiably hasty relaxation in this respect could lead to still higher prices and to a temporary economic expansion. What we must guard against is a recession that could follow such a temporary expansion.

The third concern is the yen's exchange value in relation to the international interest rate level. Japan's economic fundamentals which determine the yen's value on foreign exchanges, such as economic growth, prices and international balance of payments position, still remain healthy. Despite the fact that the yen's value is expected to remain at a high level in the long run, it has continued to depreciate of late. This is due to speculative selling of the Japanese currency on the markets, caused by the downturn in Japanese exports to the U.S. because of the recession in that country, and anticipation of a lowering of the official discount rate in Japan.

The yen's depreciation can nullify all efforts to restrain price rises, and if a government attempt to constrain domestic price rises fails because of an untimely relaxation of its control on the economy, it will invite an acceleration of the yen's depreciation. We hope the government will make policy adjustments after watching closely the official discount rate movement in West Germany and further lowering of the official rate in the United States.

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ECONOMIC

'MAINICHI' CITES PREREQUISITE FOR TAX

Tokyo MAINICHI DAILY NEWS in English 27 Jul 80 p 2

[Editorial: "Prerequisite for Tax Hike"]

[Text]

Arguments for and against increased taxation have livened up again in various quarters as influential figures of the Liberal-Democratic Party, including the chairman of the policy affairs committee, made a series of remarks suggestive of the increase, while a private advisory group to the late Prime Minister Ohira wound up a report that a tax increase is essential for fiscal reconstruction.

The move did not emerge as a result of the sweeping victory of the LDP in the last elections. It is only a matter of course that we have to take up the revenue issue in compiling the fiscal 1981 budget. Even if a coalition government had been formed, the situation would be just the same.

For four consecutive years since 1977, the state has continued issuing national bonds totaling more than 10 trillion yen. This is certainly abnormal. During the current fiscal year alone, the state has to pay a whopping 5,300 billion yen interest for the bonds it issued in the past. Whoever heard of anything so absurd? With that much interest to pay, the government has to consider floating more bonds just to keep it going. A fiscal policy dependent on borrowings from the people is bound to collapse.

It is not surprising that people in the know are very worried about the nation's fiscal state of affairs, and they have called on the government to take the bull by the horns in remedying this seemingly endless vicious cycle.

Discussions on a tax increase will probably gain further momentum. No one, not even the rich, wants to pay higher taxes. This hurts yet we cannot brush it aside. Since we live in a democratic, sovereign state and are indebted to a great many benefits, both tangible and intangible, we as taxpayers must face up to the cold reality and see eye to eye with the inevitable.

It should be pointed out, however, that there are certain conditions that must be observed. As a prerequisite to a tax increase, a thorough revamping of the existing structure of the nation's annual expenditures as well as administrative reform must be carried out.

Bureaucrats, particularly Finance Ministry officials, will not be happy about our insisting on the observance of that prerequisite and will likely say "Oh, not again!" But, this is the core of the whole problem. Should they continue to compile the national budget out of sheer habit based on conventional concepts as well, the tax increase will not help to normalize our finances. It would be like scooping up water with a bamboo basket, as the Japanese saying goes, since the desired effects of the tax increase would disappear.

The Finance Ministry in its "Handbook of Fiscal Expenditures" published recently quoted the scale of personnel expenses of public servants in stressing that the proposed administrative reform could hardly be considered an effective weapon for realizing fiscal reconstruction. What made the bureaucrats emphasize this trivial point? Thus we doubt the sincerity of the government to deal with administrative reform.

Take, for instance, the government policy concerning agriculture, forestry and fisheries. They have spent so much for subsidies and bounties in this field that most city workers are disgusted. Diet members had been frantic about getting more funds for road construction just to make a show of achievement before their constituents. Our new prime minister is renowned for his "brilliant achievements" on this score. Voices are already being heard in many circles asking whether the new government is qualified for the job of compiling a reasonable budget.

Concerning the tax debate, we hope that the financial authorities concerned will provide the nation with all information concerning state finances as a whole. It is still fresh in our memory that an increase in corporate tax was given up in the final phase of budget compilation last year.

If the government wants the support of the people, it should make all unbiased information available before the public. The government has more often than not compiled the budget in camera, and the people have become suspicious of the true intent of the government. Lack of information would be just another obstacle in the way of conducting the tax debate.

CSO: 4120

ECONOMIC

BLINDSPOT OF MITI'S TRADE, INDUSTRIAL POLICY CITED

Tokyo EKONOMISUTO in Japanese 15 Apr 80 pp 20-26

[Article by Takashi Iga, Kobe University Professor]

[Text] MITI has published an International Trade and Industrial Policy Report which gives the 1980's the status of an "era of practical knowledge." The author takes a calm look at this massive composition by talented officials.

Special Role of the Council

The Industrial Structure Council has drawn up a report entitled "1980's International Trade and Industry Policy." The report, which comes to about 80,000 words and 223 pages, was drawn up as a guide for "passing through the trials of the 1980's and beginning a new future." It is a comprehensive approach to all problems from the energy crisis and economic friction to policy for promotion of local economies and fostering of talent for technological development.

However, the actual author of this report is the Ministry of International Trade and Industry; the Industrial Policy Council simply deliberated the original MITI draft. While there was a certain degree of revision as the result of the deliberation, the basic framework was accepted more or less as in the original draft. The talented officials of MITI deliberately inserted words and phrases which deserved revision, and the focus of deliberations was diverted to that work. In that sense the council had the function of authorizing the text drafted by the officials--it served as a rubber stamp. Thus the report should be regarded as "Made in MITI."

Next it should be said that the draft report was deliberated by the "Special Subcommittee for 1980's Policy" which was set up within the Industrial Policy Council. The subcommittee had 38 members. The overwhelming majority of these were those with scholastic experience (including journalists) and representatives of big business (including financial circles), with 13 and 17 members respectively. In addition there were two representatives each from smaller businesses, labor

unions and women's groups, and one representative each from local government and the general citizenry; these can be called the minority faction.

This sort of membership structure is not limited to the Industrial Policy Council, but is found in most government councils. I said the function of the council was the rubber-stamping of the text drafted by the government, but this is primarily the role expected of the majority faction. It is possible to say that the role expected of the minority faction, on the surface, is to monitor the work of the majority faction. However, during deliberation of issues which require a fairly high degree of specialized knowledge, the members ultimately either represent the special interests of their parent organization or they are simply accessories.

But though I say the minority faction representatives are just accessories, I think there is still a social function even in that. If the minority faction members were excluded because they lack expertise, the resulting report would certainly be severely criticized as self-serving. This may well be related to the Japanese peculiarity of liking mixtures which include a little of everything. Japanese box lunches and sukiyaki are classic examples, and this peculiarity is probably the reason that one can buy study desks decorated all over with everything from bookshelves to clocks and light fixtures. Thus councils are exposed to social criticism unless they are provided with representatives of everything from women's groups to the general public, and are prepared to give a little consideration to all sorts of issues. And for that reason, reports issued by councils of this sort inevitably take an all-inclusive approach.

Soft Awareness of the President Situation

As for the content of the report, it consists of 11 chapters plus an introduction; the relationship among the chapters is shown in Figure 1. As the figure shows, the concerns of MITI--from the international economy to local economies and from technological innovations to improvement of the quality of life--extend to every corner of the Japanese economy. But, Chapter 7 on improvement of the quality of life, Chapter 8 on local economic society, and Chapter 10 on vigorous small and medium enterprises were written to deal with the previously mentioned minority faction. They make up the accessory portion. Aside from these three chapters, the outline of the report is quite simple.

Chapters 1 and 2 describe the prospects for the domestic and international situations, and they stress that what lies ahead in the 1980's is very bleak. Externally, the difficulties of oil, the international monetary system and trade friction will follow each other in close succession. Domestically, the technological progress and the young labor force which have propelled the Japanese economy will disappear. Metaphorically

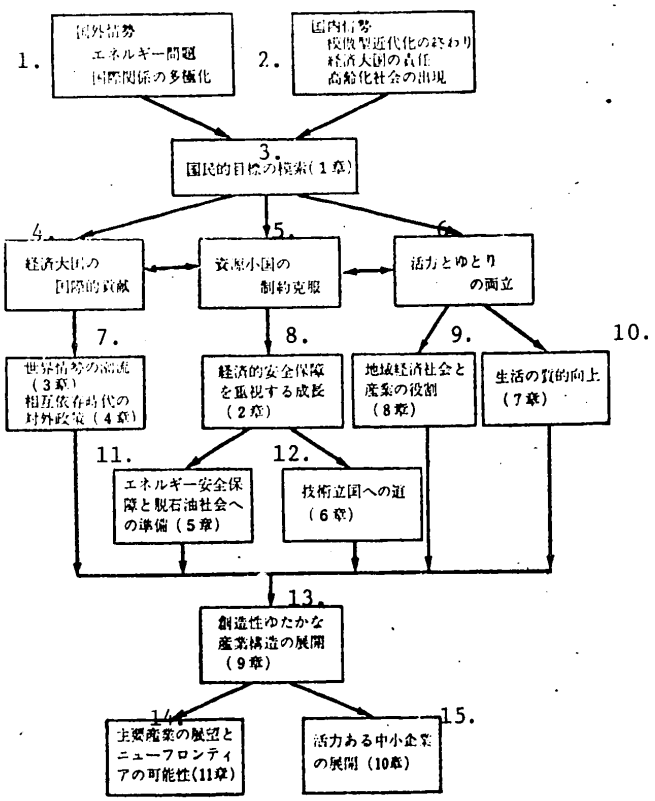

Figure 1.

Key:

1. International situation: energy problem; diversification of international relations.
2. Domestic situation: end of imitative modernization; responsibility of economic power; emergence of aging society.
3. Search for national goals (Chapter 1).
4. International contributions of an economic power.
5. Overcoming limitations of resource scarcity.
6. Vigor and relaxation.
7. Flow of world situation (Chapter 3); Foreign policy in an era of interdependence (Chapter 4).
8. Growth emphasizing economic security (Chapter 2).
9. Role of industry and local economic society (Chapter 8).

[key continued]

[Figure 1 Key--continuation]
10. Raising the quality of life (Chapter 7).
11. Energy security and preparations for an oil-free society (Chapter 5).
12. Path to a technology-based state (Chapter 6).
13. Development of a highly creative industrial structure (Chapter 9).
14. Prospects of major industries and possibility of a new frontier (Chapter 11).
15. Developnent of vigorous small and medium enterprises (Chapter 10).

speaking, we are a ship whose engines have failed at the very height of the storm. In this state, we can only drift aimlessly, driven by the wind and the waves. Therefore, the report says, we must try to escape these difficulties by setting national goals and making greater efforts.

This is rather prejudiced logic. In any collective entity, whether nation, enterprise or household, loyalty toward the group is linked to enmity toward outsiders. Phrased differently, enmity toward outsiders produces solidarity within the group. G.W. Allport found the roots of prejudice in this universal human attitude. But MITI is an economic agency, of course. Perhaps if it were a defense agency it would clamor about red flags over Pusan or the defense of the Malacca Strait, but instead it has taken a soft tone and tried to build up a sense of crisis.

As a method to overcome the crisis, the report proposes international cooperation and a technological foundation for the country. Chapters 3 and 4 are a prescription for international cooperation, and chapters 5 and 6 indicate specific policies for basing the country on technology. The International Trade and Industrial Policy which establishes these two as national goals and then develops them is set out in chapters 9 and 11. Let's look at these in order.

Will It Aid Policy Decisions?

As the report points out, Japan is economically strong but poor in resources. In physiological terms, we have an extremely corpulant physique, and are so unstable we would tumble over immediately if not propped up by international cooperation. Thus, we must maintain a relationship of coexistence and coprosperity with the advanced countries by means of horizontal division of labor, with the newly industrialized countries by means of transfer of technology, and with the developing countries by means of economic aid. This is called "getting along well with every country," and it is correct as a concept. But "getting along well with every country" is a pollyanna policy. At times we are driven into a position where we cannot get along well with any country. We are faced with situations in which we must choose between two opposing countries, and the agony cannot be avoided. Japan was soundly scolded by America for trying to buy the crude oil Iran could not sell because of the U.S. import embargo. We must be aware that this sort of thing is going to happen more and more often.

Today's world situation can be viewed as a "2.5-polar game." U.S.-USSR confrontation, a bipolar game, is at the center, and third forces including Japan and Europe are also drawn in. The situation is not that of a tripolar game because these third forces are not united. I have called it a 2.5-polar game because it is somewhere between a bipolar and tripolar game. One characteristic of that game is that it is hard to form a core. Simply put, there are too many shifting alliances. It thus becomes difficult to calculate the payoff from forming an alliance, and as a result it is impossible to establish one's intentions.

Looking just at Japan's position, we can see a variety of possible combinations; here are a few of the main ones: (1) to join with either the U.S. or the USSR to build a new world order by hegemony, (2) to join with the resource-rich, economically poor countries of the south to become a countervailing power against hegemony, or (3) to ignore criticisms that Japan is an economic animal or an opportunist, and pursue an independent line.

On this point, the report's position is greedy indeed. It says we should pursue all three possibilities simultaneously:

--With the U.S. at the center, the EC, Japan and others will increase their interdependence and bring about cooperative management of the world economy. (p 44)

--We will make an organic link between the three modes of economic cooperation--official development aid, trade and direct investment--and promote comprehensive economic aid. (p 57)

--We will raise our scientific and technological level and make use of our intellectual resources to strengthen our bargaining power. (p 24)

This is fine as a literary composition, but it probably won't be of much use as a guide for the formulation of actual policy.

Within certain limits, continuation of the confrontation between the U.S. and the Soviet Union is to the advantage of the countries of the south. It is the power of America and Europe that has obstructed the national liberation movements of the countries of the south, and the Soviet Union has functioned as an effective means to suppress that power. I think this is a common view in the countries of the south. While they don't really trust communism, they are attracted by the practical utility of the Soviets. This is the reason they have not criticized such things as the Afghanistan problem with the same strong tone as the Western countries. These countries of the south seem to view Japan as a bridge between the U.S. and the PRC, and as an agent in the containment of the Soviet Union. Simply calling for international cooperation will not be enough to develop an omnidirectional foreign policy; we will need a little more forceful concept, such as world federalism.

There is a similar problem in becoming a country founded on technology. In calling for technological development, the report lists all possible issues from coal liquefaction technology to nuclear fusion technology and from fostering of researchers to problems of the patent system. This looks just like the confusion at the scene of a fire, and does not make it possible to work out an effective technology policy. Unless the scope of the problem is trimmed a little and the key points are identified, we will end up doing nothing more than encouraging swindlers seeking subsidies.

Technological Development and Its Risks

The question of technological development must be divided into at least three stages for examination. These are the stage of development of engineering technology, and the stage of construction of capital equipment. If we diagram the relationship between the different stages, we see that scientific knowledge A is used in development of engineering technology a, which is used together with technology b to build capital equipment 1. And the operation of new capital equipment 2 results in accumulation of new scientific knowledge E. A period of roughly 50 years is required from the accumulation of scientific knowledge to its embodiment in capital equipment, and if new technology is to be put to practical use in the 1980's the principles underlying it will have to have been discovered in the 1930's.

Watt discovered the principle of the steam engine in 1765, but it was 1804 when Stephenson applied this principle in building a steam locomotive, and 1825 when the world's first railroad was constructed between Stockton and Darlington. And while Faraday discovered the principle of electromagnetic induction in 1831, it was 1861 when Pacinotti built a generator and 1882 when Edison constructed the first central power station. Thus, technological progress requires a long gestation period.

But the real question to be considered is what incentives to use to encourage technological progress can be promoted by fostering large numbers of the technicians who carry out research and development, by eliminating the risks involved in research and development, and by investing copiously.

But this sort of flat, unimaginative view will not be adequate. The nature of risks, for example, is different in each stage of development. The risk in the stage of constructing capital equipment is primarily one which comes up in relation to the market; there is great risk of injury from inadequate demand or a drop in prices. This was the cause of RCA's losses in development of computers and Kohjin's development of the flame-resistant fiber Kohderan.

But risks in that stage of development can be avoided, to a certain extent, through market research and demand forecasting. In that sense the 1980's

are certainly not opaque. It is as good as certain that energy prices will rise and the young labor force will peak out, so there won't be much risk in investments in energy-saving devices, labor-saving devices or alternative sources of energy.

If investment does not increase despite this certainty, the reason will be that there are more favorable investment opportunities in other sectors in which business choose to invest. Regulation of investments in such areas as land, foreign currency or stocks would be a real countermeasure, and there would be no need to cover risks.

Risks in the stage of development of engineering technology, by contrast, will require relief measures to some extent. An example is the losses suffered in new engine development by Rolls Royce. The probability of loss in this stage is even higher than in the capital investment stage. According to a survey by Joseph Heller, the probability of loss in the capital investment stage is 66 percent, but in the research and development stage it reaches 80 percent.

I think the probability of loss is even higher in the stage of accumulation of scientific knowledge. The discovery of X-rays and penicillin were matters of good fortune; these can only be called blessings from heaven. In that sense, even the introduction of economic incentives in this stage will not guarantee results. Preparing the conditions for research and providing assistance is the most that can be done; after that it is a matter of waiting patiently for the scientists to strike paydirt. The Scientific and Technical Council has carried out any number of surveys on researchers, and I wonder if a more realistic policy couldn't be worked out by making use of those surveys.

'Era of Practical Knowedge,' But...

This report, then, seems to be a sort of unfinished symphony. The first movement is international cooperation and the second movement is basing the country on technology, but there should be a third movement which has not been written.

My own feeling is that the motif of the third movement should have been the structure of big business. Considering that about half the members of the subcommittee were representatives from large enterprises, I would think they would like to develop that motif.

As Galbraith asserted, the present economic structure has come to have a dual structure, with planning among the large enterprises and competition centered among the small and medium enterprises. Trying to explain this dual structure by forcing it into the competitive model can only end in failure.

Chapter 9 of this report is a really desperate explanation; it is hard to understand why such roundabout arguments have to be made. The title of Chapter 9 is "Development of a Highly Creative Industrial Structure," but I think they must really have meant "Development of a Highly Imaginative Industrial Structure Council."

The following ideas are written in section 8 of that chapter.

A. Free and fair competition insures the efficiency of industrial activity.

B. Industrial activity up till now is judged to have been efficient on the whole.

C. It can thus be assumed that on the whole there has been free and fair competition in industrial activity so far.

D. But since restrictions on competition are expected in the future, strict application of antitrust laws will become necessary.

A and C should be left out of this series of arguments; B and D convey the sense adequately by themselves. To start with, the fallacy of the idea that efficiency an be maintained if there is just free competition was demonstrated by Keynes some 50 years ago. It is thus best to delete Argument A. If it must be kept, it should be revised to something like this:--A'. Reliance on free competition is better than arbitrary administrative interference for maintaining efficiency.

This is the proper way to state the classic liberalism of Smith and Ricardo.

Expansion of the scale of an industry and expansion of organization of an enterprise each contribute to the other. This is behind the emergence of oligopolistic structures in industries like steel and automobiles, and it is impossible to reverse the trend now. In practice it would be impossible to strengthen antitrust laws and demand the breakup of large enterprises. MITI is correct in asserting that much. But the large enterprises have great power, both economically and politically, and the abuse of that power would do away with social justice.

Therefore it is necessary to watch that the giant enterprises do not abuse their influence. To state this more positively, it is necessary to create a mechanism which will directly relate the prosperity of big business to the well-being of the majority of the people. And so, there is no need at all for stopgap arguments like, "We will block the evil of restraints on competition."

If anyone wants to restrain competition, he should be allowed to do so. The resulting increase in profits to large enterprises can be siphoned off and distributed to the public or reserved for public works.

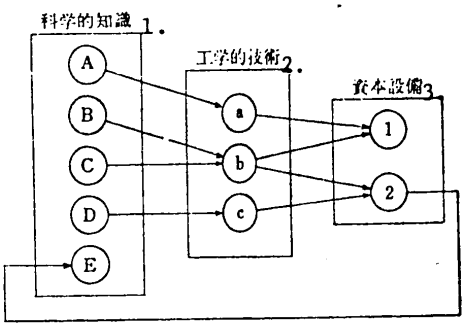

Figure 2.

Key: 1. Scientific knowledge
2. Engineering technology
3. Capital equipment

Galbraith proposed establishment of a corporation with its stock held by the public; this corporation would then buy up all the stock of the large enterprises. Of course, the principle of separation between ownership and management should be preserved, and there should be no interference in management except in cases where the interests of the stockholders are being harmed. This sort of linkage between a publicly-owned corporation and financial assets would also solve, to a certain extent, the problem of pensions in an aging society.

I read through the report repeatedly, trying to find such a proposal, and I was quite disappointed that I could not find even a fragment of the idea. The Introduction of this report calls the 1980's the "era of practical knowledge." This means it is an era in which knowledge will not just be accumulated and stored--it will also be put to practical use. I think that in that case there should have at least been the proposal for a publicly-owned corporation.

An American I have known for the last 20 years cannot distinguish between the sounds "Esu" and "zu," no matter how often he is corrected. As a result he still pronounces "tsusansho" (MITI) as "zusansho" (slipshod ministry). I am afraid that if MITI gets this excited about an "era of practical knowledge," it will become a "zusansho" indeed.

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SCIENCE AND TECHNOLOGY

SEMICONDUCTOR FIRMS: BULLISH PLANT, EQUIPMENT INVESTMENT

VLSI Pushed

Tokyo NIKKEI SANGYO SHIMBUN in Japanese 15 Apr 80 p 5

[Text] The VLSI (very large-scale integrated circuit) age is just about to unfold. Japan's large semiconductor makers are pointing toward all out efforts in mass production of VLSI in the 1980's, and it is expected that this year's production will top last year's record-breaking sum by 30 percent in facilities investment totaling roughly 140 billion yen. They will be setting up production lines for the 64 kilobit RAM (random access memory) which is considered the "gateway" to VLSI. Medium and lesser semiconductor makers including Fujitsu, Mitsubishi Electric, and Oki Electric Industry, are also entering into this business with the intent of closing the gap between them and the "peak 3" consisting of Nippon Electric, Hitachi Limited, and Toshiba who already sell more than 100 billion yen worth each year, and there is heated competition in facilities investment.

(A series on "Electronic-Electric" front will start on the 16th)

Start Off with Mass Production of 64 Kilo RAM

April 1st was the day new workers who will sustain the company in the 1980's were welcomed. Mitsubishi Electric's ceremony for welcoming new entrees this year was held at its Itami Plant (Itami City in Hyogo Prefecture). The Itami Plant is Mitsubishi's research and development stronghold for semiconductors. President Sadakazu Shindo emphasized that the business strategy for the 1980's will be "Mitsubishi in electronics," that will be the theme around which electronics will be taken up by the entire company." It is said the reason this ceremony was held at the Itami Plant was to make the new entrees become aware of the importance of the semiconductor area as represented by IC and LSI.

There was reason for this strong statement by president Shindo. Mitsubishi is known as the first company in Japan to produce IC, but its

present sales in the semiconductor area amounts to but 1/3 that of Nippon Electric which is the present leader. There is a feeling within the company that "this is a mortifying situation."

"Strength and weakness in the semiconductor area will determine the fate of electronic related makers from now on." This is the concensus of the large semiconductor makers such as Nippon Electric. As is evident from the data in the accompanying table, the 10 large companies which are representatives of Japanese industry in the areas of computers, communication equipment integrated electric business, and household electrical appliances all have within the past few years taken the step of investing in the semiconductor area. According to one source (director Teruyuki Nishijima of Toshiba "if one neglects to invest in facilities for semiconductors which are the nuclei of electronics, he will be lacking in business strategy."

This competition in plant investment is about to become even more active with the dawn of the VLSI age which seems to be just around the corner. Nippon Electric which is investing the record-making sum of 30 billion yen in the history of the electronic makers of Japan has this to say, "the favorable aspects of the IC business will continue, and sales will depend upon the supply capability" (Director Jungi Ouchi) thereby stressing the importance of this investment. Hitachi Limited and Toshiba are maintaining their high level of investments, and their top people say, "this is something we have to do."

Each company is concentrating on VLSI production lines with the thought "the VLSI production plants and investment scale of the future will be one order of magnitude greater, and this is a factor responsible for raising the level of plant investment in a 'no ceiling' manner." What each company is aiming at is the mass production of the 64 kilobit VLSI which incorporates the capabilities of more than 100,000 transistors and which has already appeared on the market. These products which are considered to be "gateways" to VLSI are expected to find wide use in computers during the first half of the 1980's, but the feeling in the semiconductor industry in such fierce technological innovation orientation is that "the one who puts his mass production unit in orbit before rival makers will be the eventual winner." All the companies seem to agree on this point, and this view is reflected in the form of plant investments.

Nippon Electric is pushing reinforcement of its VLSI test production and development line at its Sagamihara Plant in Kanagawa Prefecture which is its main bastion in the communication equipment area and is also hastening completion at its Kyushu Nippon Electric Plant (Kumamoto City) which is reputed to be one of the world's top VLSI production plants started last year for the production of 64 kilobit VLSI and the succeeding 256 kilobit VLSI through its No 6 diffusion line. Hitachi, Limited which is breathing hot on the heels of Nippon Electric is pushing completion of

its Musashino Plant (Kodaira City in Tokyo Urban Prefecture) for the production of 64 kilobit LSI class and better units while Toshiba is doing the same at its Oita Plant (Oita City). Mitsubishi Electric is directing half of its plant investments to its new Kumamoto No 2 Plant (Gasshi-Town, Kumamoto Prefecture) saying, "we will win out in this VLSI era competition and rise to the top group level" (semi-conductor group leader Tamio Sato).

The other companies which are pursuing this top group are putting all efforts into reinforcing their main plants. Matsushita Electronics at its Kyoto Nagaoka Plant, Sharp at its Nara Tenri Plant, and Tokyo Sanyo Electric at its Oizumi Town Plant in Gunma Prefecture are directing their maximum efforts in semiconductor development at their own plants. In addition, Fujitsu at its Kanegasaki Plant in Iwate Prefecture and Oki Electric at its Kiyotaki Town Plant in Miyazaki Prefecture are starting construction this year on the latest in semiconductor plants.

It seems likely that the plant investment plans of the Japanese semiconductor industry which is now greeting the arrival of the VLSI era are continuing on a plan to maintain this more than 10 billion per year investment every year on the part of the larger makers for some time to come.

Trends in Semiconductor Plant Investment and Sales of Large Companies
(Unit: 100 million yen)

	Plant Investment			Sales		
	JFY 1978	JFY 1979	JFY 1980	JFY 1978	JFY 1979	JFY 1980
Nippon Electric	155	270	300	1,195	1,575	2,045
Hitachi Limited	100	150	200	1,000	1,300	1,650
Toshiba	60	100	100	850	1,000	1,300
Fujitsu	116	160	220	286	565	900
Sharp	20	88	33	384	560	670
Matsushita Electronic Industry	50	100	170	400	500	650
Mitsubishi Electric	60	80	100	385	440	540
Tokyo Sanyo Electric	15	43	80	250	310	400
Oki Electric Industry	34	53	120	107	175	260
Sony	45	50	80	--	--	--

(Note) includes IC and other semiconductor products. Sony does not sell semiconductors separately. Estimated values included. Matsushita Electronic Industry concludes business in December, Tokyo Sanyo Electric in November, Sony in October, and all others in March.

The United States semiconductor industry is presently beset with high interest rates as a result of which Fairchild along with the world leading oil exploration equipment makers Schlumberger and Mostec have come under the wings of the conglomerate United Technologies whose main forte is in the air and space area. In contrast, the large Japanese companies are putting forth vast sums for research and development and plant investment over long periods on their own strength. This is indicative of the great "strength" of the Japanese industries to which the American industries are struggling to keep up and is causing increasing resentment displayed through anti-Japanese attack.

Semiconductor Activities

Tokyo NIKKEI SANGYO SHIMBUN in Japanese 16 Apr 80 p 5

[Text] Over the past 10 or so years, the semiconductor makers of Japan have been pouring money and manpower into putting as many transistor units into silicon chips a few millimeters square as transition is being made from IC to LSI. In this manner the LSI age has been ushered forth, and the developmental race has become even more fierce. All the companies are increasing their investment plans tremendously in order to come out ahead in this competition. Aiming for the expanded semiconductor market which already is expected to close in on the "1 trillion yen," total, the strategies of these maker companies have assumed diverse and very active forms. We spoke to managing director Jungi Ouchi who is the "overall mentor" of the semiconductor activities of Nippon Electric which is the largest of these makers, and he served as the lead-off batter of the representatives of the 10 companies interviewed.

(Reporter Nonaka)

Nippon Electric

[Question] There is expected the positive commitment of 60 percent of the total investments to the semiconductor area again this year in the investment strategy not only by the Japanese but the American semiconductor industries. What is the background for such concerted efforts?

Time for Plant Investment and Success

[Answer] There is constant pursuit of need to plan plant investment if one is to stay on top in the semiconductor business. The semiconductor business is one in which there is strong influence of the equipment business, and as indicated by the term "money eating bug" which is often applied to this industry, investment in equipment greatly controls whatever share which is allotted this business. The manner in which the needs of the market are read greatly determines the rise or fall of a business.

Speaking in terms of IC, the annual rate in increase over the past few years has been of the order of 20 percent. Of this total, memory and microcomputers have shown more than 30 percent increase. Since it is anticipated that the semiconductor market from here on will increase at an even greater pace, plant investments must be increased. To be sure, Nippon Electric is hoping for an increase much greater than the other companies, and this year's investment total was determined based on a long-term plan. We even anticipate there may be an upward revision sometimes during this year, and we are forever trying to increase our share.

It has been said that this situation is one in which "one is beset with red ink and conducts business to get out of the red," but we are now at a time when we hope to reap some profit out of the money we spent in the past, and we are anxiously awaiting the outcome.

[Question] Where is the point of all these investments?

[Answer] As you are well aware, increasing the production capability of the domestic plants to comply with the rising LSI demand is a life or death situation. We plan to be producing 20 million LSI units per month by the end of this year. This involves hastening the completion of the No 6 diffusion line at the Kyushu Nippon Electric Plant (Kumamoto city) which is our main plant and increasing the diffusion capability of the Sagamihara Plant in Kanagawa Prefecture which has been involved in test production and development of the 64 kilobit RAM (random access memory). We will commit 6 billion yen to Kyushu Nippon Electric and 4 billion yen to the Sagamihara Plant. The diffusion line is referred to as the "heart" of semiconductor production, and the precision of diffusion will determine the LSI product quality. As a result, the newest lines with maximum automation and conservation of energy processes will be installed and thereby open the gaps between us and our rivals with respect to plant stoppages and product quality. These are important strategic moves aimed at winning the competition in the VLSI era.

[Question] Domestic and foreign rivals have already come out with samples of their 64 kilobit RAM which is termed the "gateway" to VLSI, but has not Nippon Electric come out with its product?

[Answer] The memory market is presently inundated with 16 kilobit RAM, and worldwide shortage has resulted in a stampede of inquiries. When seen from the standpoint of supply and demand balance, the life of the 16 kilobit RAM is likely to be unexpectedly long, and it will probably be about 1982 when its successor the 64 kilobit RAM becomes the mainstream. Our development is already completed, and we are planning to introduce our product with an eye on the market movements. We have succeeded in research and development on the 256 kilobit RAM using a 1.5 micron design rule by optical technology through a reduced transcription

method, and we feel we have the lead in VLSI strength. Just how to implement the development plan and the product design into the marketing strategy is a theme which will assume increasingly greater importance from here on.

[Question] According to plan, semiconductor sales totaled 264 billion yen of which IC accounted for 142 billion yen. Doesn't TI (Texas Instrument) which is the world's largest keep second-ranked Motorola at a respectful firing range?

Meaningless Rankings

[Answer] The worldwide rankings of semiconductor makers are not too reliable. It has been estimated that TI has twice the production of Nippon Electric, but any comparison with Motorola and lesser companies changes with the yen market making the comparisons without substance.

Should the yen become 20 percent less in value in a year, our ranking will fall not to third or fourth but possibly to fifth. This is why these rankings are rather meaningless.

To be sure, it is not too far from the truth to say that we are the maker next in line to TI.

[Question] What about your overseas strategy?

Integrated Production Between Japan, United States, and Europe

[Answer] American production of semiconductors has been through strengthening of the 16 kilobit RAM production system of Electronic Arrays (EA) which we purchased 2 years ago in December. Because of the sudden increase in demand for the products of this system in the American market, production was increased to 100,000 units per month this past February. We expect to raise this capacity to a 500,000 unit production system during the course of this year. This will restore the EA operations back to black. Since American nerves are being tightened as the result of sharp increase in imports from Japan, we are hoping to ease Japanese-American friction in the semiconductor area through this approach.

In addition, we are planning to increase production capability in Malaysia. Since there is some concern that the sparks of this semiconductor friction will leap from the United States to Europe, we are planning to follow the assembly plant in Ireland with an integrated production plant also in Ireland or in Scotland or the United Kingdom for which surveys are presently under way. We will pursue a course of integrated production for the three major markets of the world: Japan, United States, and Europe.

No Relaxing in Alert on Semiconductor Friction

Director Ouchi was in charge of medical equipment after which he became the central figure of Nippon Electric's semiconductor strategy since 1966. "Ouchi of semiconductors" is a well-known figure around the world. "It has been said that putting more than one-half of one's capital into semiconductors is a risky business," but he has the background of a resolve that placed this company as one of the three strongest companies in the world in this area and he prides himself on change. He voiced optimistic sentiments throughout the interview, but he chose his words carefully and became very serious when the subject turned to Japanese-American semiconductor friction. He had been playing a spokesman role to make all out effort to avoid this friction, but he said as the result of lack of unity within the industry that "it is difficult to achieve harmony as the case with colas. The automobile is presently the target of (Japanese-American) friction, but the semiconductor problem will eventually arise," he states in a warning tone. Director Ouchi was acting for an audience.

Toshiba Approach

Tokyo NIKKEI SANGYO SHIMBUN in Japanese 17 Apr 80 p 5

[Text] Toshiba is hotly contesting Hitachi Limited for second spot in the semiconductor industry. It has to date yielded a slight lead to Hitachi, and it has adopted the slogan "close chase of Nippon Electric, beat Hitachi." As attested by the separation of its electronics parts sector which takes in semiconductors and other areas of the electronics sector on 1 April, it is going all out to "attain second rank." We went to Director Teruyuki Nishizawa of Toshiba to hear of this company's approach.

Toshiba

[Question] Your 1980 plant investments in the semiconductor will total 10 billion yen which is the same as last year. This is somewhat conservative when compared to the other large makers.

Mass Production of LSI at Oita

[Answer] One should not be led astray by the figures one sees, and what is more important is how effective and appropriate the investments are. This is why I do not feel that we are at all conservative. The basic strategy is to increase our semiconductor sales by 30 percent this year. The investment to this end was determined several years ago, and this year's investment is intended to lay the stepping stones for the LSI era which is expected to take over the stage in the 1980's. To be sure, pressure of the semiconductor business centered on the 16 kilobit

RAM may cause us to speed up increase in production, and there is ample possibility of some upward revisions to the investment total during the course of the year.

[Question] At the present time you are using your Kawasaki transitor plant as the development plant for VLSI, but do you plan to convert Toshiba's main IC and LSI plant in Oita (Oita City) to a VLSI production line?

[Answer] The Oita grounds still have room for expansion, and the construction to date has left room for new construction at any time. The preparations are okay. The real production of the 64 kilobit RAM which already has undergone sample shipments is planned to have its production line be sited within the Oita plant.

[Question] You have overwhelmed the other companies in the line of desktop CMOS and LSI and have exceeded the others in abundance of products although many are to fulfill in-company needs. What is the essence of your future strategy?

We Will Go to Changes in the Business

[Answer] We will not follow an overall policy but follow the priority principle. Microcomputers and memory will be the principal pillars. Starting with the electronic engine control device to be produced for the Ford Company of the United States, car electronics related elements will be an area in which our "strength" will be exploited in the future. We will concentrate our strength in the newly established electronics parts sector and go into changes in business.

[Question] You were the last batter among the large makers when it came to entering the American market, however, you purchased a plant with superior production facilities and were able to initiate operations in January of this year. In this manner, you were able to make up for your lost time in one swoop. How do you propose to develop your future overseas strategy?

We Will Eventually Have Plants in Europe

[Answer] Toshiba Semiconductor which is located at Sunnyvale in the state of California and which presently is the on-site production plant for the American market was the object of an investment of 10 million dollars, and this is where we will concentrate production of the 16 kilobit RAM which is seeing sharply increasing demand. To this end we will conduct training of well-experienced workers. We feel that we must also build on-site plants in Europe as well, but plans are indefinite at the present time.

[Question] It seems that the increased production system of the Malaysia semiconductor plant is about to go into orbit.

[Answer] The on-site plant in Malaysia in the form of Toshiba Electronics Malaysia (Kuala Lumpur) started assembly of linear IC in JFY 1979, and the work has proceeded extremely well so that this plant is now producing 2 million units per month. The production of small signal transistors has been increased from the 15 million monthly of the previous year to 20 million units per month. There has been active entry of television, audio, and watch set makers into Southeast Asia, and we are serving as supply bases to these plants. About 80 percent of the production of Toshiba Electronics Malaysia is directed to the Southeast Asia market. The system in which one supplies to the areas he advances is one which probably will be adopted by the Americans and Europeans.

Active Efforts To Take Second Place

Toshiba surprised the industry when it received a large volume order for a control unit (EEC) for an engine incorporating microcomputers from the Ford Company of the United States in June 1977. The number of EEC units supplied to the Ford Company has already exceeded 100,000 units, but Director Kawanishi said, "the car electronics market has not developed as much as we had expected. There is considerable decrease from what we had initially estimated." He registered his unhappiness in this manner. It is claimed that the basic attitude is "squeeze out the essential points and introduce changes," but judging from the deft movements displayed on their entry into the American market as described above, this company seems about to develop active movements which are aimed at "sole second place."

Mitsubishi Semiconductor Strategy

Tokyo NIKKEI SANGYO SHIMBUN in Japanese 18 Apr 80 p 5

[Text] Semiconductor strategy of Mitsubishi Electric to date has been a rather modest affair. It together with Hitachi, Limited and Tashiba has been ranked as the top three integrated electrical companies, yet, in the area of the semiconductor sector as represented by IC and LSI type basic electronic components, this company not only trails top maker Nippon Electric by a wide margin but also has considerable ground to catch up on the second-ranked Hitachi, Limited and Toshiba Electric. In other words, it is a "minor" company in this respect. President Sadakazu Shindo made this most recent remark, "we will like to be called Mitsubishi Electric the electronic giant," and this undoubtedly indicates reinforcement of the semiconductor sector. This company which made several hits in household electrical appliances starting with blanket dryers is in a stage of metamorphosis in the area of semiconductor strategy. We interviewed Tamio Sato chief of the semiconductor sector who is the pilot of this company in the semiconductor area.

Mitsubishi Electric

[Question] What is the reason for Mitsubishi Electric ranking second and belonging to the lower group of the 10 large makers in the semiconductor business?

Laying the Foundation for VLSI Mass Production

[Answer] Put into a single statement, this was the result of placing emphasis on a balance between profit and products when we made investments in the semiconductor sector. We are frankly aware that there is considerable difference between this company and the top companies in the matter of sales. This is why we have set our sights on obtaining 10 to 15 percent of the share in the semiconductor market by 2 years from now in 1982, but here again we will adopt the concept of "pursue profit rate" as the primary policy as we make out plant investments.

[Question] We hear that plant investments will total 10 billion yen in 1980 which is the largest in your history of which exactly half or 5 billion yen will be directed to the Kumamoto No 2 Plant (Nishi Gasshi Town, Kumamoto Prefecture) which is your semiconductor production plant.

[Answer] This company's semiconductor production lineup is for the North Itami Plant (Itami City in Hyogo Prefecture) to be the research and development brain. Kumamoto No 1 Plant (Takita-cho, Kumamoto City) to be a production plant, and the Kumamoto No 2 Plant to be the mass production plant. This Kumamoto No 2 Plant is the special plant for the diffusion process which is the "heart" of semiconductor production, but construction on a diffusion plant for the production of 4-inch wafers for the mass production of 64 kilobit RAM use was started in May with the intent of initiating operations next spring. The foundations for mass production of VLSI are being laid.

In addition, the Kumamoto No 1 Plant where considerable assembly work takes place is presently operating at full capacity, and it has assigned a part of its assembly functions to the Fukuoka Seisakusho (Fukuoka City) which is a plant producing electrical machinery such as electric hoists. Despite this situation, the plans are to reinforce this plant and increase its production capability.

[Question] Do you feel your preparations for the VLSI age which will blossom out in the 1980's adequate?

'We Will Not Follow the Tracks of Later Starters'

[Answer] Because this company was late in product development of the 16 kilobit RAM which is the principal item in today's memory market, user's evaluation lagged behind while we were late in getting on the bus

to the market confrontation. Fortunately there was an extreme shortage of 16 kilobit RAM, and our production rose 20 percent over the previous year in 1979 when monthly production was in the 300,000 to 400,000 range, and we expect a further increase of 20 percent this year. We do not intend to fall into this same rut of delayed entry where VLSI is concerned and we have been making sample production of 64 kilobit RAM by the superfine MOS (metal oxide membrane semiconductor) process since September of last year. We will time the stage of production initiation once the new diffusion plant for VLSI production goes into operation at the Kumamoto No 2 Plant.

[Question] The weight of discrete units such as thyrister makes up 40 percent of the sales in the semiconductor sector, and the recent development of products aimed at energy conservation is eyecatching.

Also Reinforce Discrete Semiconductors

[Answer] The expansion rate of the discrete market is smaller compared to the LSI and IC markets, but it is nevertheless a large market which comprises about 40 percent of the semiconductor market. The large makers have increased their weight in the IC and LSI areas, and we are not necessarily committed to closing this gap. On the other hand, it is a fact that we are putting strength into the discrete area. We would like to foster the name "Mitsubishi in discrete" even further.

Our successes in power transistors and photo trigger thyristers which were the first developments of their kind in the world will be the lever by which we will pursue development of discrete products for electricity conservation applications. This will also aid in fulfilling intraplant needs of the electronics sector of electric appliances which are the backbone of Mitsubishi Electric.

[Question] The first step in on-site production of semiconductors in the United States is said to be granting American makers the rights to conduct test business. Do you have any plans for entering the American market in the future?

[Answer] We are presently granting the rights to a test business which is the core of the semiconductor assembly process to a specialty company in California's "Silicon Valley," and this is an indication of our entry (into the American market). There are no specific plans as yet, but I am somewhat skeptical of any merit in siting a plant in the United States when the quality of present American labor and its training are considered.

Rollback with a Powerful Organization

"Fertile but not conspicuous." Mitsubishi is considered in such a light in the semiconductor area which is the most active sector of the Japanese

electrical makers. Mitsubishi is now in the process of rolling back this concept. Last May on the occasion of the 20th year of its entry into the semiconductor industry, the company's top echelon headed by President Shindo assembled at the production plant in Kumamoto to plan its strategy. The net result was the establishment of a "LSI Laboratory" for reinforcing large plant investments into the Kumamoto No 2 Plant and strengthen the research and development system, and this company's plans are gradually assuming specific shape. Mitsubishi's "change in spirit" associated with this reinforcing of its semiconductor area is buttressed by its background of a powerful industrial organization, and activities are converging in this area in a manner similar to the eye of a typhoon.

Sharp Production

Tokyo NIKKEI SANGYO SHIMBUN in Japanese 19 Apr 80 p 5

[Text] Production of Japan's first electronic translation machine followed by the introduction of a voice synthesis machine. "Sharp's products have distinction." This is the evaluation of the electrical industry which is a good indication of this company's unique semiconductor strategy. Only 10 years ago this Sharp Company was but a set maker which relied on other companies to supply its semiconductor needs. It introduced technology from the American Rockwell Company in the development of LSI for its desk calculator (electronic desktop calculator) and followed a thorny path as it struggled for domestic production. It has presently grown into an influential maker specializing in microcomputers and CMOS (metal oxide membrane semiconductor). While it is a young company, it has been referred to as a "new powerful faction," and it looks toward VLSI as its next focal point. Kosaku Okano who heads the electronic parts industry headquarters at the comprehensive development center of this company located at Tenri City in Nara Prefecture is commanding the forces in this company's efforts to increase its capacity.

Sharp

Estimate 23 Percent Increase in Sales

[Question] You have just completed your No 3 semiconductor plant within your comprehensive development center with an investment of 10 billion yen.

[Answer] We expect to initiate operations in July. Only about half the production equipment has been installed as yet, and we are delayed by the delivery of the electron beam exposure unit from the American Itec Company which is an indispensible adjunct to our "fine finishing center" at our no 3 plant for VLSI test production and development which will not take place until June. Since a considerable fraction of our production equipment is shipped in from the United States, we do experience a number of unexpected cost increases and headaches. There is demand from within the company to "start production as quickly as possible," and we are continually under stress.

[Question] What are your production plans once the new plant goes into operation?

[Answer] Half of Plant No 3 will go into operation from July, and it will be next year before full operation will be in force. At that time the monthly production capability of LSI will be 1.0-1.5 million units. This, together with the production of the No 1 plant, will give us a capacity twice the present level to 3 million units per month, and a production system in line with the demand structure will go into orbit. The main force will be directed at memory products for microcomputers, ROM and RAM.

Where memory is concerned, we expect to go into 16 and 32 kilobit dynamic RAM for which samples will be coming out this year and the mass production of the 96 kilobit ROM which will have the greatest memory capacity in the world and which will be the heart of the electrical translation unit. We will also concentrate on our "fine finishing center" with the purpose of establishing technology for VLSI production. With the operation of Plant No 3 total sales of the electronic parts industry for this year is expected to increase 23 percent over last year to 67 billion yen. Of this total foreign sales will account for a 33 percent increase to 45 billion yen.

Start Cooperative Efforts with American Companies

[Question] What about your strategy in the microcomputer area which is expected to play a major role in business machines and household electrical appliances?

[Answer] In addition to the self-developed 4 bit-1 chip microcomputer "SM series," the other mainliners are the "A 180" and the 16 kilobit "Z-8000" which was acquired by technological agreement with the American Rockwell Company. The production capacity is 1.5-1.6 million units per month overall.

What we particularly have held important is the contract we signed with the Zylog Company along the lines of a second source. We are the only Japanese maker involved in such an agreement, and we intend to exploit the superiority of this system design. Monthly production of "Z 180" is but 30,000 units, but it can be enclosed within the light programmable "pocket computer" which will be placed on the market in March. This unit is said to find many uses in intracompany applications. Once Plant No 3 goes into operation, we expect to be in good shape because production of the 16 bit "Z-8000" can be expanded.

Activate Jointly Financing Company

[Question] There is considerable assembly work going on at the Tenri Plant of LC and LSI which have been produced at that plant, and this is

in response to sharp increase in demand and an effort to further reinforce the production system. We have established a new company with Takaya (main company at Ibara City in Okayama Prefecture, President Nagaroku Otsuka, capitalization 40 million yen) by joint subscription, and operations have been initiated with a monthly production of 1 million units. The expansions of the joint financial outlay mode system involving cooperating companies is an effective strategy, and we hope to go all out in promoting this system.

[Question] Isn't the production of LCD (liquid crystal indicating element) at your Nara Plant in very favorable position because of the increased demand for desktop electrical calculators and watches?

[Answer] Compared to LED (light emitting diode) or fluorescent indicating tube, LCD has the advantage of consuming less electric power and its application in display units is undergoing great expansion in the market. The LCD production capability is between 3.4 million to 3.5 million per month which places this company with the top members of this group in Japan. The indicating device which transmits information treated by the electronics along with LED and has the role of "face of electronics" will be produced at the Nara plant by completely automated process, and the mass production system will be reinforced further.

Squeeze the Development Target To Achieve Results

What must not be forgotten about Sharp's semiconductor strategy is that by establishing photo semiconductor technology, this company has drawn ahead of the others in the mass production of solar batteries. This is the result of having squeezed the developmental target in the form of "developing a semiconductor with unique characteristics."

The integrated development center which stands on a rise in Tenri City of Nara Prefecture has a group of tombs in its ground which depict a strange contrast with this most leading of semiconductor production sites. Plant No 3 which has just been completed is a newest type construction which has been rendered dust free to the extent that it belongs to the "super" dust free category of "class 100" with less than 100 pieces of dust greater than 0.5 microns per square foot. There is a new row of 100 million unit production facilities, and test operations are being repeated. While guiding us around this new facility, Chief Okano said, "even when we attain full operation, when I consider the present demand for semiconductors, the day will come when production will not keep up with demand." In this manner he was already planning some other new site.

Sanyo Electric

Tokyo NIKKEI SANGYO SHIMBUN in Japanese 22 Apr 80 p 6

[Text] Tokyo Sanyo Electric is in charge of semiconductor production for the Sanyo Group. The main plant at Oizumi-machi, Oura-gun, Gunma Prefecture is the site of the former Nakajima Airplane Plant. It is now 21 years since this company located here, and there have been new additions following new additions, and the wide expanse of 1.3 million square meters is nearly completely covered at the present time. The construction of a new semiconductor plant is presently under way in this maze of structures. IC can be grossly classified by construction and performance into bipolar and MOS. Where this company is concerned, the bipolar type linear IC used in stereo and television accounts for 90 percent of the production. In order to rid itself of this "one lung flight" image, a line solely for MOS production is being installed in this new plant with the aim of establishing a new flight pattern. Director Shingo Iwase is in charge of this strategy. This head of the semiconductor industry sector is well known as one of the pioneers in the Japanese semiconductor industry.

(Reporter Nonaka)

Tokyo Sanyo Electric

Memory and Related Items Are the Main Forte

[Question] When will the special MOS production plant aimed at "all weather type" operations strategy development go on stream?

[Answer] We are aiming for August as starting date, but full-scale production will be some time during the latter half of 1981. Construction was started in February. In order not to disturb the neighboring linear IC plant which is in full operation by vibrations, excavations were made down to 16 meters below ground level for the concrete foundation in the complex construction which is being installed. As a result, the construction has been somewhat delayed from the original estimate. This new plant is a two-story affair (floor area of 3,300 square meters) of 12 meters height providing considerable leeway. The total investment is expected to rise from 6 billion to 8 billion yen.

[Question] What about your production plans?

[Answer] We hope to produce 4 million MOS units per month at this new plant. This is a figure which includes IC and LSI. The production items will be mainly nonvolatile memory, memory for computers such as the 4 bit microcomputer, and watch use items. The total sales in the semiconductor area for 1979 by Tokyo Sanyo was 30 billion yen of which the bipolar IC to MOS ratio was 9 to 1. Looking at the monthly production figures,

bipolar accounted for 10.8 million units and MOS 1.2 million units. The new production expected to come on stream during the latter half of 1981 will be biased toward MOS production. Since there is possibility of expanding the present bipolar production lines, there will be total production of 18 million units per month.

Thick Membrane-C, Increase Production Strength

[Question] What is unique of Tokyo Sanyo's semiconductor capabilities is the competitive strength of its hybrid IC. In this area, this company is said to be the top maker of high power thick film IC for audio use.

[Answer] Demand for this thick film IC increased greatly during the past few years, and the supply is unable to keep up with demand. We can presently produce a million units per month, and we believe we supply 70 percent of the world market in the audio area. Thick film IC does not require heat dissipation considerations, and we have had inquiries from IBM as a result of which some samples were sent in January of this year. This may be thought to be a strategic export item, and we are planning to expand this increased production system.

[Question] What about your VLSI test production and development?

[Answer] We call this the VLSI development plan. The VLSI technology development center at the Gifu Plant located in Yasuhachi Town in Gifu Prefecture is where this development is going on. Plant investment for a 3-year plan was allotted in 1979, and a project team was recruited from the entire Sanyo Group. VLSI development is being actively promoted here. There is all the necessary equipment. The question of whether to produce 64 kilobit RAM and higher class products at the semiconductor mass production plant of Tokyo Sanyo is awaiting studies on the market situation, cost factors, and fulfillment of intracompany needs. Considering the present situation in which we have our hand full, this production will probably be deferred to a later date.

Self-Development of Microcomputers

[Question] You have a technological agreement with the Fairchild Company of the United States in the matter of microcomputers.

[Answer] In January, 2 years ago, we entered into an agreement with Fairchild to supply them with the technology related to a nonvolatile memory which does not erase when power is cut off and can be rewritten in exchange for which we received information on the production process for the 8 bit microcomputer "F 8" series and its peripheral information. Two years have gone by since this technology exchange, and we have adapted the production technology for "F 8" to a 4 bit microcomputer which we plan to mass produce. This is an area in which we hope to do considerably more self-development.

One Step Forward Toward "All Weather Type"

Director Iwase frequently says "the line of thought to date that linear IC is the basic mode for IC conversion of consumer goods such as television or audio equipment which has been the rule based on experience is gradually crumbling away." The expectation that microcomputers will begin to find wide use in household electrical appliances and thereby increase the weight of MOS was one that had to be judged together with the need to fulfill intracompany needs, and this led to a speedup in the construction of a new MOS plant by Tokyo Sanyo.

This company's semiconductor strategy was along the line of "we are a semiconductor maker, so we need to point toward linear," but it was decided to throw weight toward MOS this year. This is the story behind the step toward "all weather type." Mr Iwase with 25 years of semiconductor business experience said, "even when the other companies were struggling in the red, we managed to show profit." In this manner he presents an awesome figure when he argues the investment versus effect problem singularly directed at the unique semiconductor situation. Although there are large gaps between this company and Nippon Electric, Hitachi, and Toshiba, he states emphatically, "we have been producing only linear to date, wait till we also add on MOS" as he looks forward to "that day."

Fujitsu

Tokyo NIKKEI SANGYO SHIMBUN in Japanese 23 Apr 80 p 5

[Text] Fujitsu is a "giant" in the computer area which is waging an effective campaign versus IBM. This company's semiconductor sector which supports its computer sector was separated as an independent business 2 years ago, and it has since actively entered the outside sales market. As is clearly stated by the saying "go to a bakery if you want bread," semiconductor strategy which is involved mainly with the memory products used in the "heart" of the computers and which is beginning to assert itself more and more is sometimes referred to as the "eye of a typhoon." Certainly, this is no unappreciated effort, and semiconductors line up with computers and communication equipment as one of the three pillars. "We are a clearly established semiconductor company." These were the words of Chief Shinmin Yasufuku of the semiconductor industry as he used the carrier so abundantly used to transport this company's semiconductors as a weapon to attack the situation in the manner given below.

Fujitsu

'Shadow' On the American Market

[Question] Japanese exports of 16 kilobit RAM (ramdon access memory) to the United States increased sharply last year. Fujitsu seems to have benefitted to the extreme degree in this situation.

[Answer] I feel that the market environment is closing in on a state of change. The demand from the computer makers of the American market remains strong. At the same time, the increased production systems of the semiconductor makers have gone into orbit at an even higher level.

For example, there was a shortage of 16 kilobit EPROM last year, but there is a fairly good supply situation presently. There still seems to be considerable shortage of 16 kilobit RAM, but this picture may change by the latter part of this year. It is clear that the memory market, particularly the movement in the American market, is considerably different from last year.

[Question] The domestic companies headed by Nippon Electric seem to have read in active memory markets this year as well. You are the only one who sees a "shadow."

[Answer] This adverse climate appears in the price of 16 kilobit RAM on the American market. The vast purchases by IBM maintained the demand last year, and there was no drop in price. On the other hand, the average price of 16 kilobit RAM on the American market is presently about $6.00, and this represents a slight decrease. The American makers who had been suffering from lack of production now seem to have increased their supply, and this fulfillment of the supply side setup is beginning to be reflected in the price picture. Illustrating this situation along the lines of the semiconductor business feelings, the users said last year, "we have no seed to plant the next crop, and we ask your help." This is no longer the case today.

Expand the Kagoshima Plant

[Question] Your plant investments this year will total 42 billion yen of which more than half or 22 billion yen will be directed to the electronics sector including semiconductors. In this respect, you are second only to Nippon Electric.

[Answer] Although this does not mean that all of this money is for the semiconductor headquarters, a considerable amount is for the semiconductor plant at Kanegasaki in Iwate Prefecture for which groundbreaking ceremonies were held on the 23rd of this month. This large project will account for a major share of this sum. We expect this new plant to be the second IC and LSI plant which will follow the Kaitsu Plant (Kaitsu in Wakamatsu City). We hope to start operations in September, and some of the first work will be the assembly process of IC and LSI produced at the Kaitsu Plant. Despite one addition after another, the Kaitsu Plant is running out of space. The Iwate Plant in due course of time will be an integrated plant with a diffusion line.

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The one other domestic plant site is the Kagoshima Plant (Kagoshima Fujitsu) whose assembly line operations 2 years ago suffered from lack of manpower problems. This problem has finally been resolved in orderly manner, and we intend to expand this plant this year.

Start Next Month on Plant in the United States

[Question] You announced last fall your intent to construct a plant in the city of San Diego in the State of California as an American plant. In addition, you seem to be seeking a suitable site in Europe for which Ireland seems to be the prime candidate. Let us hear of your overseas plans.

[Answer] It seems that construction of the San Diego plant will begin along about May, and this represents some delay. I cannot give the production plans although I can say that we are thinking of between 1 to 2 million LSI units per month. Of this production, we hope to direct a 3 to 16 kilobit RAM. We have picked a likely site in Ireland, but we have as yet not purchased the land. We are thinking of placing an assembly line at the Ireland plant just as Nippon Electric is doing. I believe we will be able to start operations in 1981.

[Question] Where the 64 kilobit RAM frequently referred to as the "gateway" to VLSI is concerned, Fujitsu has led the rest of the pack in production, and you are also leading in placing samples in circulation. Does this mean you have confidence in the VLSI era?

[Answer] When one refers to VLSI, he is speaking of 1 megabit class products. The 64 kilobit RAM which we have formed on a 6.44 x 3.36 millimeter silicon chip by exposure to light does not represent that great a memory capacity extension.

At any rate, we have laid the foundations for reacting to what is expected to be a 64 kilobit RAM market 2 years hence, and we have already set up a mass production line in our Kaitsu Plant. A production line is also being installed at the new Iwate Plant. While we may be in the lead at the present time, we will soon be challenged by Nippon Electric and Hitachi with their tremendous volume capacities. We plan to continue to provide our customers with high level products such as 64 kilobit RAM.

Main Effort in TTL Sales

[Question] The bipolar area includes TTL (transistor-transistor logic circuit) whose role in MOS memory is in great intracompany demand. Is this an item which is being exploited?

[Answer] We are in the top group together with Hitachi. On the other hand, the share of TI (Texas Instruments) of the domestic market is high as before. While it was not because it has been said that "TTL will

not be profitable" but the sales have not been too good to date because we have had problems in our assembly capabilities. We made all out effort since last year to fulfill our customer's demands, and we have derived a measure of results.

Prime Candidate to Enter the Top Group

"I will not mention production figures or values." Mr Yasufuku nailed down the lid in this manner firmly even before the interview. Being one of the main framework on Fujitsu and with responsibility for the semiconductor area, he chose his words carefully and deliberately. "Combine subtleness and boldness" describes the in and out of company evaluation of Yasufuku. His character seems to be reflected by the semiconductor strategy of this company. He surprised the top echelon of the other companies with his statement "since last year the very lucrative 16 kilobit RAM market seems on the verge of turning the corner," and this "reading" of the situation was contrary to what all others thought. It was 2 years ago when outside sales were entered in earnest while still paying great attention to intracompany needs. "Our outside sales now total 70 percent of total sales. We can now operate as an independent semiconductor company" was his statement which reflected his great confidence. This may well portray why this company may be the prime candidate to join the top group headed by Nippon Electric.

Hitachi Limited

Tokyo NIKKEI SANGYO SHIMBUN in Japanese 25 Mar 80 p 5

[Text] Hitachi, Limited lost its top status in the semiconductor industry to Nippon Electric in 1975. The gap between these two companies has been widening since then, but the heads of the other companies in the same business say in unison, "we are fearful of Hitachi's latent strength." This company produces semiconductor production equipment starting with the electron beam exposure device which is indispensible to VLSI production within its own group, and it certainly does not suffer in its technology development strength compared to its rival Nippon Electric. The factors which determine the strength of a semiconductor maker are the technology development strength and the plant investment strength along with marketing strength. Hitachi which is well known as a steady business has during the past few years turned to some determined plant investments and changes in business tactics to mount a counterattack. We interviewed Director Hiromu Asano who has the responsibility of restoring Hitachi's niche in the semiconductor area.

Hitachi Limited

Increase and Expand American Plants

[Question] You shifted your bipolar production from the domestic production system centered at the Musashino Plant to the Takasaki Plant and the

MOS to the Kofu Plant (Kofu Branch of the Musashino Plant), but have you established the mass production system of the Musashino Plant?

[Answer] We started out in JFY 1978 to engage in this conversion tactic at this production site, and we expect to complete operations this year. This change was necessitated because of space limitations at the Musashino Plant greatly limiting the work. Mass production of leading products centered on 16 kilobit and 32 kilbot EPROM type memory products and microcomputers has been put on stream at the Musashino Plant. Our production of the 16 kilobit dynamic RAM for which demand has sharply increased is about 1 million units per month, and half of this production is ticketed for export. We have also been using the Musashino Plant as development site for VLSI of the 64 kilobit and higher class RAM.

[Question] Your start on operations of the plant you have in Dallas, Texas, has been greatly delayed. It seems you ave having considerable difficulties in your American operations compared to Nippon Electric.

[Answer] Because of our rush in setting up plants all over the world for the semiconductor industry, we had difficulty in obtaining certain necessary equipment as a result of which the start in operations was greatly delayed; however, we did commence operations near the end of last year. We still have not come to a three-shift working stage, but a comprehensive assembly line has been put into force. Put in terms of an automobile gear shift system, we are presently operating at "low," and we will gradually shift to "second" then to "high." Full production will be attained in August. At that time the monthly production of dynamic RAM will rise to between 3 to 4 million units. This is small compared to other companies, but we will follow the basic Hitachi policy of "nurture the small to become large" as we develop this business. While we are still in the blueprint stage, we plan to expand our American plant during the course of this year.

Sharp Increase in Export Constructive Type

[Question] You have advanced all the capital for a semiconductor production site in Europe located in West Germany.

[Answer] We are planning to initiate operations in January 1981. This move is in response to the increased demand for semiconductors in Europe. This will be a 3 million per month 16 kilobit assembly plant just as the one in the United States. We want to activate the local labor to obtain the same diligence as Japanese workers and raise production efficiency.

[Question] Now it seems that you have crossed the mountain pass in the memory market particularly where the American market is concerned.

[Answer] I have a feeling that there has been a slight easing in the demand and supply situation in the memory market particularly in the

principal item the 16 kilobit dynamic RAM. Of course, last year's shortage was exceptionally great, and this situation has simply eased a little. There is also the factor that the supply capability has improved somewhat. If we listen to the American side, this situation is the result of the three Japanese companies which led the field into the market and the other two Japanese companies which followed later setting up such fierce onslaught and which has caused much irritation. The demand for memory in the Japanese market has not grown as much as we had hoped, but the United States offers the capacity of a "bottomless marsh." The sharp increase in exports to the United States is the result of structural factors which are associated with this capacity of the American market.

Check Low Value Exports

[Question] There are rumors that the Americans are up in arms because this sharp increase in imports is the result of the 16 kilobit RAM being exported at low price.

[Answer] I believe that such is not the case; however, I do also hear that there is something of the kind around. This is a ticklish situation when Japanese-American friction is considered. Semiconductor products are small in size, and it is difficult to trace their movements once they leave the plant. I also hear that electronics specialty companies are buying up the domestic market, and these may be exporting the domestically trained material at lower price overseas. It would be desirable that there be order in the exports, and we are now conducting checks on the destinations of our products, and we have initiated strict control.

[Question] It is said that the Japanese attitude toward the 64 kilobit RAM which is the leading batter of the VLSI age is much superior to the American attitude.

[Answer] We are in a quandry whether or not to produce this item as quickly as possible. The requests from our American users have already begun to heat up. At the same time, what is in a Hamlet frame of mind is the Japanese influence which caused so many problems with the 16 kilobit RAM is causing even more problems with the 64 kilobit RAM capturing an ever greater share of the American market, and the impact on the friction is becoming of greater concern.

In addition, it is not known what the "giant" IBM which went outside to procure its 16 kilobit RAM will do when it comes to 64 kilobit RAM. Since last year IBM even shaved its research and development investments and has been sending out extraordinarily large orders to the American semiconductor manufacturing equipment makers. It should have greatly increased its semiconductor producing capabilities. On the other hand, it is said that IBM has a mountain full of back orders similar to the "E series

computers" and its semiconductor production strength has not yet caught up. The world's largest semiconductor maker TI (Texas Instruments) which led the way in the matter of the 64 kilobit semiconductors is said to be redesigning its product. Such being the case, Japanese makers may be producing a considerable amount of this product.

Cost Absorption Is Problem

[Question] Finally, we come to the question of the Japanese makers headed by Nippon Electric starting to raise the prices of semiconductors citing the high cost of the noble metals such as gold and silver. What is Hitachi's position?

[Answer] The gold and silver prices rose to astronomical levels but have since subisided, and the situation seems to have stabilized. We have raised the prices on some of our export items, but the semiconductor business is a fierce one in which the user readily says, "we quit buying" when prices are raised. The problem here is just how to absorb the increased cost of raw materials.

Squeeze Main Points From 'All Directional Strategy'

In a personnel memo dated 21 February, Director Asano handed the position of head of both electronic industry headquarters and semiconductor industry to Director Sutezo Hata. He says, "I have recently not gone too frequently to the Musashino Plant because I feel that I should take a broader look at the electronics related sector." He was directed by President Yoshiyama to reorganize Hitachi's semiconductor sector, and he is devoting his time wholeheartedly to this heavy responsibility. While he smiles constantly and speaks with a somewhat disinterested tone, he scans the semiconductor market with piercing eyes. "If one thinks he can apply what goes well in Japan to overseas situations, he can do it. Conversely, if one attempts something which did not go too well overseas in Japan, there is need for some sort of technology or supervision." In this manner, he described the difficulties of conducting semiconductor business in the United States. In regard to Japanese strength in the American memory market he said, "enter while treading lightly." "Hitachi's semiconductor role is not that of an all around player who does everything but one who squeezes out the main points." He plans to reinforce Hitachi's semiconductor area from this lofty position.

Oki Electric

Tokyo NIKKEI SANGYO SHIMBUN in Japanese 26 Apr 80 p 5

[Text] Oki Electric Industry made the transition from "reduced volume business" to "reorganization." In this situation the hustle in the semiconductor sector is eyecatching. This attitude is well displayed by the new plant construction plans for mass producing VLSI at its plant in Kiyotake Town in Miyazaki Prefecture. "We have placed this company on

the line" (President Masao Miyake). This new plant will reinforce its electronic device (overall term for integrated circuits and other semiconductors) sector and be the "central nervous system" from which business development aimed at advances in the communication and computer areas will be made. This effort on the part of Oki Electric which had been languishing among the lower class of the Japanese semiconductor industry was set off with the start on its Miyazaki Plant in May. On the other hand, there are some who say that this decisive and bold action is "too soon." We asked Director Noboru Ota head of the electronic devices industry for his views.

Oki Electric Industry

Aim To Start Operations During Latter Half of Next Year

[Question] The Miyazaki Oki Electric Establishment Group which will promote construction of the new plant was organized last month, and it seems that the VLSI project is finally under way.

[Answer] We hope to have the groundbreaking ceremonies on 27 May. The plant investment will most likely increase 20 percent over the initial estimates to 12 million yen. Since we are importing the greater part of our equipment from American makers, we are seeing the effects of decrease in yen value in the money exchange market and increased construction costs. This new integrated production plant which will produce 64 kilobit memory class and higher class products are expected to go into operation during the latter half of 1981. Since the advent of semiconductors particularly leading VLSI plants will be the important points in future strategic developments, the next year will be a most important period.

First To Go Into Production of 16 Kilobit RAM

[Question] When one looks at the memory market movements, now is the peak period of the 16 kilobit RAM, and the RAM, and the 64 kilobit RAM will come on the scene in another 2 years considering the life cycle of the 16 kilobit RAM according to informed sources. In such a light, how do you place this mass production of VLSI at your Miyazaki Plant?

[Answer] This new plant is equipped with facilities to produce VLSI memory, and we will start off with production of 16 kilobit static RAM with the same level of integration as the 64 kilobit item and which has a circuit pattern width of 3 microns. When compared with dynamic RAM, this unit has simple peripheral circuit makeup, and there is sharp increase in demand for its use as the memory of the terminal devices in microcomputer applications. Our 64 kilobit dynamic RAM was test produced and developed under the technological guidance of the Telegraph and Telephone Public Corporation. It will be incorporated into the digital electronic exchange unit of the Public Corporation. The installation into the

No 1 electronic exchange unit which is expected in 1981 will be at the Hachioji Plant (Hachioji City in Tokyo-to) for electronic devices, but the succeeding operations will be by mass production at the Miyazaki Plant. To be sure, product plans will be modified in line with the practicalization of VLSI and the application era as well as market movements, and the conversion to electronics of this company's main line products in electronic communication equipment and information processing equipment will be promoted.

Special Order Itmes Which Have Expanded Greatly

[Question] Oki Electric's strategy to date has been to concentrate on CMOS·LSI for watch use where the company has led all other companies. In this manner, it was directed mainly at custom ordered products. Will you be increasing the weight of your industrial products?

[Answer] Just as you said, our market to date has mainly been involved with custom orders (special order items) centered on CMOS for watches, cameras, and audio. This is different from a very large maker who makes products for all kinds of applications in the role of a "department store." Tempered by outside customers' demands to "produce devices of high levels of integrations," other companies have catered to the customers to increase their businesses by 20-25 percent over the past 2 years while we enjoyed increases of 60-70 percent. Now, plant investment including that for the new plant has become huge, and we have to go to other types of sales. To this end we intend to go into industrial type products such as memory items in addition to the custom order products.

Also Reinforce Chichibu Plant

[Question] Do you not have to reinforce the production system at the Hitachi Plant until the Miyasaki Plant comes on stream?

[Answer] We have made provisions for that. When we newly installed a "control center" at the Hachioji Plant about the end of last year, the No 3 Building which housed the development team for circuit design and business management section became open, so a start was made to put in a production line. This increased IC production at the Hachioji Plant from the 6 million per month at the end of 1979 to 7 million per month this fiscal year. Even then the supply has not kept up with demand, and we are considering increasig production at the Chichibu Plant which is a branch plant of Hachioji and which has an assembly line.

[Question] What about reinforcing the business end?

[Answer] We reorganized this year the IC business section which had been under the electronic device industry business headquarters into the first and second sections. The custom order products which have been the mainstay in the past along the lines of external IC sales were placed

under section 1 while section 2 is designed to take over the sales of new products such as memory microprocessors which will be actively promoted from here on.

Development of American Market Is Subject From Now On

President Miyake assumed his post in Oki Electric just 2 years ago in April 1978. He said, "When I came here from the Telegraph and Telephone Public Corporation, what concerned me the most was just how to interface with semiconductors. There were the rock bottom days of February 1977 when this company could not become a member of the VLSI research group. Yet, the same company was the first in this country to introduce the electron beam exposure device and instinctively refrained from using the term 'super LSI' but instead started its VLSI project." "We gritted our teeth and did our research" (Director Ota), and the net result was then "we also picked up strength" (President Miyake). While this company was able to capture the order for custom products for CMOS·LSI from a certain camera company, President Miyake says, "the real test of this company is from here on." The main subject from here on is export effort to the American market which heretofore has been essentially nil.

Matsushita Electronics

Tokyo NIKKEI SANGYO SHIMBUN in Japanese 2 May 80 p 5

[Text] The Matsushita Electronic Industry is the semiconductor strategy company of the Matsushita Group. It sustains all the electronics conversions of household electrical appliances produced by the Matsushita Group including microcomputers and television. This Matsushita Electronics has now indicated a desire to enter into the industrial production area from the consumer group IC and LSI semiconductor front, and this is causing considerable concern to the other makers. Its Nagaoka Plant (Nagaoka City in Kyoto-fu) is its LSI development center in which there are two electron beam exposure units where it promotes mass production of masks for use in memory of microcomputers. It is presently getting set to enter the LSI development contest. Although there is considerable margin between its production and sales totals compared with the top three companies including Nippon Electric and Hitachi Limited, Vice President Kazuo Fujimoto of this company said, "We do not know what our goal is or who our rivals are. We constantly look at our profit margin while we look for new semiconductor markets." Matsushita Electronics is an IC maker with the potential of making some spectacular developments.

Matsushita Electronic Industry

Shini Plant Will Be New Site

[Question] Your plant investments in the semiconductor field showed a major jump compared to the previous year of 70 percent to 17 billion yen.

What can you say about the new VLSI plant construction which is the major target of this investment?

[Answer] We started construction of this unit in March at the Nagaoka Plant grounds. We have allotted 10 billion yen toward this construction, and we expect to see it completed in November. We have amassed a total of 5 billion yen to date in test production and development of VLSI, and our development force has increased considerably. The results of this effort are exemplified by the development of the 64 kilobit static RAM with circuit pattern width of 2 microns which is a VLSI of the maximum degree of integration reported in the world which was described at the solid state circuit conference held in San Francisco last February. We have finally come to the mass production stage. For the present, it will be put into the microcomputer which is our most profitable item, and we will enter mass production of memory items. We are anticipating a business of about 1 billion yen per month.

[Question] What are you doing to increase your production capacity?

[Answer] We have the semiconductor industry headquarters at Nagaoka which is the site of our main domestic production along with an IC plant at Shini (Shini City, Niigata Prefecture), a varicap plant at Utsunomiya, a diode plant at Takatsuki City in Kyoto Prefecture, a small signal transistor-thyrister plant at Okayama, and an LED (light emitting diode) plant at Kagoshima. Every effort is made to rationalize and automate these plants to reinforce the mass production structure. We hope to expand our IC production from 18 million units per month to 30 million units per month by next year.

The Nagaoka Plant is the sixth factory plant for the production of VLSI, and this has created some space problems. This is why we are planning to designate the Shini Plant which started operations in August 1976 as the next mass production site. This plant has the wide expanse of 72,600 square meters where there is presently but a single linear and bipolar IC plant leaving considerable room for further construction. Electricity, water and high quality labor force are in abundance. It has already had a diffusion process installed. It is an integrated bipolar IC plant, and we hope to add on an MOS related plant next year. Our blueprints call for a future in which the Nagaoka site will be the headquarters and Shini the mass production site.

To Monthly Production of 5 Million Micons

[Question] What are your plans for the profitable micon production?

[Answer] Microcomputers are used not only in consumer goods but in a number of other areas, and this is an area which we believe we can exploit our capabilities the best. The 4 bit microcomputer used in television, VTR, and sound equipment is now being produced at the rate

of 2 million units per month, and it accounts for 20 percent of the domestic market. We export 40 percent of the production to the United States. This production will be increased to 5 million by the end of this year. We started development of the 16 bit microcomputer 5 years ahead of the other companies. The 8 bit item which was very short in supply was rectified by a contract with the large maker Motorola of the United States to serve as a second source as a result of which the finished microcomputer could be offered.

[Question] You have succeeded in producing industrial use semiconductors during the course of the past few years.

[Answer] The ratio between consumer and industrial products is presently 7 to 3. This ratio is 6 to 4 for the semiconductor market overall, and we feel we need to increase the weight of our industrial products. Microcomputers and consumer use IC have been unusually strong areas in the past, and we will use this background to further enhance our positions in these areas. At the same time, we will go all out in developing our industrial products. We are also approaching the newly developing information equipment systems market exemplified by automobile telephones, home use facsimiles, and captain system [phonetic].

No Plan of Entering the United States

[Question] In January of last year you established your semiconductor production plant in Singapore (Singapore Matsushita Electronics Plant). What do you plan to do next?

[Answer] There is active influx of television, audio, and related set makers into the Southeast Asia area, and your Singapore plant is supplying these set makers; however, our increased production is not keeping pace with the demand. By the end of this year this plant will be producing 1.5 million IC units and 13 million transistors per month. Even then we will be unable to keep up with demand, and we plan to start operation of a second plant nearby. This new plant will produce 5 million IC units per month and 20 million transistors.

[Question] The large makers built production sites in great haste in the United States. What are the Matsushita Group's plans for semiconductors in the United States?

[Answer] We have no specific plans at all. When I personally think of the worker quality and the tremendous spinoff of technologists, I doubt whether there is any merit in locating a plant in the United States. I feel that the top echelons of the other large makers also feel that way.

Overwhelming Importance of the Profit Ratio

"An industry contributes to society by creating a profit. The semiconductor business is no exception." This was the statement from Vice President Fujimoto when we questioned him about the facilities versus effect relationship unique to the semiconductor industry. He also added: "emphasis on profit rate is the Matsushita policy." With respect to the large investments made during the past few years, he said, "We have completed our plans to enter the industrial area. We now have to make sure the emphasis on profit rate is completely indoctrinated."

Matsushita Electronics is based on the three pillars of semiconductors, electron tubes, and illumination, and the semiconductor sales have increased to 40 percent of the overall sales. It is using the technological strength it nurtured during its independent development of VLSI as a weapon to be employed in electronifying the strategic products of the Matsushita Group such as household products and business computers. It is serving as the promotion mother body, and it is assuming greater importance in the Matsushita Group.

Sony's Plans

Tokyo NIKKEI SANGYO SHIMBUN in Japanese 5 May 80 p 4

[Text] Sony was the first in Japan to start off on transistors. When President Emeritus Omi Ibuka heard in 1952 about the development of transistors in the United States, it was not more than 2 years later that he succeeded in making his own PNP alloy type transistors in May 1954. This was the true start of the Japanese semiconductor business. This Sony semiconductor strategy was not to sell any of the transistor products outside but to be used solely to fulfill intraplant needs for which purpose the company focused on the production of high quality material in great volume. In this manner a distinct line was drawn between it and the other companies in the trade. This is why production records of Sony were not known. According to a survey conducted by the Bank of America on Japan's semiconductor industry, Sony ranked eighth among the Japanese companies in 1979 in total sales (18 billion yen). Sony took the lead in the popularization of CCD (charge coupling element) which is needed for the greater use of VTR. It may be said that other companies look carefully at the latent power of Sony's R and D force. We asked semiconductor chief Suiichi Nakamura of Sony's plans.

(Reporter Nonaka)

Sony

We Are Developmental Makers

[Question] Let us hear about Sony's unique semiconductor plans.

[Answer] We are not a semiconductor maker. We do not produce all kinds of semiconductors with heavy emphasis on external sales as is the case with Nippon Electric but we consider products to be used within our company's products our first priority. In this respect we are a developmental maker or we may be termed a maker for internal use products. We follow a principle to purchase items such as linear IC which can be obtained from other sources, and we do not make them. Whatever external sales we engage in are very limited in scope. We purchase a large quantity of semiconductor products just as other set makers. Product development is limited to a very high level which leads other companies but we also look to mass production to lower cost. In other words, we place our faith on the "learning curve" (learning curve: when cumulative production doubles, then cost is lowered by about 30 percent) which is no different from the other companies.

[Question] You have a main plant in the form of the Atsugi Plant in Kanagawa and also the Sony Kokubun Semiconductor (Kokubun City, Kagoshima Prefecture). Can you give us some specifics on your explansion plans?

[Answer] The Kokubun Plant to date has simply been an assembly plant for semiconductors, but we installed a diffusion line which is the heart of semiconductor production as part of a pretreatment process a year ago. We docked this system together with the already established system in February of this year, and an integrated production line has been under operation. This was originally planned for May, but everything went so well that we could move it up a few months. The diffusion line is a 4-inch wafer production line, and it incorporates some of the top class capabilities in this country. This 6,000 square meter test line is one we are proud of. With initiation of integrated operation, manpower was increased to 500.

Atsugi Plant To Be the Main Center

[Question] Atsugi has been undergoing addition after addition, and it should be fairly crowded by now.

[Answer] We intend to make further additions to our Kokubun Plant. In the meantime, we hope to use the Atsugi Plant not simply as a production line but also the central plant where research and development is conducted. We also plan to increase the capacity of another of our assembly line plants which is the Shiraishi Semiconductor Plant (Shiraishi City, Miyagi Prefecture). To be sure, one of the reasons for installing a diffusion line at Kokubun was to avoid the possible loss of all

semiconductor sources in the event of a fire or some other calamity. We plan to pursue a mass production program with Atusgi as the nerve center aided by Kokubun and Shiraishi.

[Question] You succeeded in January to be the first in the world to make practical color television using photographic CCD, and you have managed to lead your rival makers in the matter of CCD development. Has CCD now come to the mass production stage?

[Answer] One of the purposes for installing an integrated production line at the Kokubun Plant was with mass production of CCD in mind. We have been using the test production line at Atsugi to solve the various problems relating to mass production. The video camera with which we were so successful was adapted for aircraft use and has been installed on all Japan Airline planes. The heart of the camera uses 2 CCD chips. CCD has about 120,000 semiconductor elements concentrated in a 19.6 x 9.1 millimeter silicon chip and it has necessitated production technology of as high a level as VLSI. We are not sure how much we will produce, but we have the confidence it can be mass produced.

Win or Lose on "Koko No 1"

[Question] What about your plans for semiconductor production for television audio?

[Answer] Take for example the microcomputer which is considered the focal point for the conversion of household appliances to electronics. We have been depending on other sources for this item, and anything which can be purchased should be purchased according to our basic plan. We concentrate on making products other companies do not have. The MNOS (metal nitride film oxide film semiconductor) type nonvolatile memory is something only Sony has which is used in electronic selective units. Production is up to 100,000 units per month. The same can be said for CCD. We also have an audio use transistor, but it is with a product called "Koko No 1" which will determine our destiny. We assigned personnel number to rival those of the large makers in this research and development and we have put in considerable funds for this effort.

Plant Investments Grow by the Year

"The feature of this battle was that the battlefield was even more narrow than that of the battle of Sekigahara." Chief Nakamura described Sony's semiconductor strategy in this manner. This company which had put its strength exclusively into internal sales has exploited to the maximum limit any merits from its research and development targets. The mission of its central research laboratory is "search for the 'something' which may turn out to be future sprouts," and the level of this research group personnel is said to be in line with the best.

This attitude of purchasing what other companies can produce and producing what other companies cannot produce has something in common, although of somewhat different scale, with the plans of companies such as Pioneer, Cannon, and Leco who recently turned to self-production of semiconductors. Plant investments for semiconductors during 1979 totaled 5 billion yen which was sharply increased to 8 billion yen in 1980 which indicates the thinking of this company.

If now the policy of "we will as a matter of principle not engage in external sales" persists from now on, there has to be some policy different from the other large makers who depend on external sales in order to recover the investment. The top man in operations and who once directed the Nobel Prize winner Reiona Ezaki is President Kazuo Iwama, and it will be interesting to see what he comes forth with.

IC Industry Plans Described

Tokyo NIKKEI SANGYO SHIMBUN in Japanese 7 May 80 p 8

[Text] How does one go about recovering the vast sums expended in plant investment--the answer to this question is what is perplexing the minds of the heads of the 10 large companies headed by Nippon Electric which were covered in this series. This plant investment race unique to this industry often referred to as the "money eating bug" is only following an increasing trend. These companies which are getting ready for the VLSI age think it commonplace to put 10 billion yen level investments as exemplified by the statement "an expansion in production scale in line with investment of an order of magnitude difference in volume is necessary for the IC and LSI era" (Director Ouchi of Nippon Electric).

Reexamination of "Learning Curves"

Invest 16 Percent of Sales

It is said to be 10 years since the semiconductor industry of Japan took off, and the first foundling years were beset with the problem of worsening income in the face of gigantic investments. The fact that this industry was able to endure this difficult stage and presently be classed as among the top industrial groups as far as profitability is concerned is well reflected by the performance on the socalled "learning curves" which were produced as the results of surveys by the Boston Consulting Group. According to this curve, when cumulative production doubles, there should be approximately a 30 percent reduction in price which is a "rule of experience." This industry faithfully followed this principle of mass production which enabled it to establish this remarkable record.

There is now growing awareness in the top echelons of these different companies that there may be need to reexamine this "learning curve"

principle. As shown in the appended table, the Japanese semiconductor makers for the past 5 years have been investing an average 16.6 percent of their sales toward research funds and another 16.0 percent in plant investments. It is said that the steel industry invests 8 percent and the automobile industry 7 percent of sales for plant investment which clearly shows how large the plant investments of the semiconductor industry are.

"When One Considers the Profit Recovery Area--"

This plant investment is for readiness in greeting the VLSI age, and it is made necessary, for example, by vast sums such as 500 million yen for an electron beam exposure facility which is an indispensable adjunct to this technology in order to maintain this high level. "When the profit recovery area is considered, the time has come when it is necessary to consider emphasis on profit rate and setting prices than to engage in a price reduction contest accompanying mass production according to the "learning curve" principle (Director Asano of Hitachi and Director Nishijima of Toshiba). In this manner, there is a business policy aimed at emphasis on profit rate rather than expansion of one's share of the market.

To be sure, the heads of these companies are in agreement that "the magnitude of plant investments is the prime factor which determines the strengths and weaknesses between makers." They are also in agreement that the "1980 decade will see the semiconductor market increase by 20 percent each year and become a 3 trillion yen industry by the end of the decade." The problem here is just how to recover from the high load of these plant investments and improve the profit picture. This is where the courses taken in the business strategies of the different companies take different turns.

Investment Turnover Becomes More Difficult

Director Iwase of Tokyo Sanyo made the following statement on this situation. "Should a semiconductor industry invest 10 billion yen a year, it must increase its sales by 30 billion yen the next year in order to stay solvent. I have been referring to this situation as a thrice turnover of investment, and this turnover is becoming more difficult because of the increasing costs of the production facility units." Director Ouchi of Nippon Electric concurred by saying, "The investment necessary 2-3 years ago in order to increase production by 10 billion yen was 5 billion yen, but it now requires 7 or 8 billion yen and there seems to be no end in sight to these increases." In this manner he complained that plant investments "know no ceiling," and he has gone all out trying to develop promising markets to recover the investment.

This spring the semiconductor industry finally resorted to a price increase citing the high cost of noble metals such as gold and silver.

While the example of desk calculators (electronic calculators for desktop use) may apply here, the user who has through long experience been under the impression "IC and LSI will become cheaper and cheaper" was the subject of great shock. At the same time, there were viewpoints expressed such as "this is the opportunity to reassess the breadth of price reductions associated with greater mass production in order to assure the profit rate" (Director Iwase of Tokyo Sanyo Electric). There is already a start toward reevaluating the effects of the "learning curve."

Price Differentials Are Expanding

If we assume that the semiconductor industry which is an equipment industry and is known as the "money eating bug" is burdened with the fate that it cannot disengage itself from the spell of the plant investment race in the future, then the large makers who are presently specialty makers will probably become top makers in computers, communication equipment, and household appliances depending on the American situation and keep on exploiting their strengths. At the same time, the judgment of "which are the growth industries" will be tempered with "how does one recover his investment in line with the plant investment and technology development race." In this sense the VLSI age may become an age in which the levels in difference between industries may become even greater.

(Reporter Nakano)

IC Sales and R and D, Plant Investment Costs of Japan's Major Makers
(Unit: million yen, values in ( ) are ratio versus previous year, values for 1978 are estimates)

JFY	IC Sales (A)	R & D Disbursements (B)	B/A (%)	Plant Investments (C)	C/A (%)
1973	86,223 (--)	17,029 (--)	19.7	18,874(--)	21.9
1974	83,404 (96.7)	18,532 (108.8)	22.2	17,595 (93.2)	22.2
1975	108,158 (129.7)	21,524 (116.1)	19.9	11,379 (64.7)	10.5
1976	164,924 (152.5)	24,297 (112.9)	14.7	35,191 (309.3)	21.3
1977	155,474 (94.3)	24,456 (100.7)	15.7	21,958 (62.4)	14.1
1978	251,881 (162.0)	37,997 (155.4)	15.1	45,932 (209.2)	18.2
1979	356,424 (141.5)	46,585 (122.6)	13.1	62,235 (135.5)	17.5

Note: Ministry of International Trade and Industry survey

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SCIENCE AND TECHNOLOGY

GOVERNMENT DRAFTS PLAN TO MINE DEEP-SEA MANGANESE ORE

Tokyo THE DAILY YOMIURI in English 29 Jul 80 p 4

[Text]

The government has decided on a seven-year ¥20 billion project to develop techniques to recover manganese ore from the seabed, which is normally found at a depth of about 5,000 meters, it was learned Monday.

The project drawn up by the Natural Resources and Energy Agency of the International Trade and Industry Ministry (MITI) is designed to realize self-sufficiency in the supplies of such key metals as nickel, cobalt, copper and manganese, which are all contained in seabed nodules, in the later half of the 1990s.

Japan solely depends on imports in securing these industrially-essential metals, buying them mostly from Zaire, Zambia and South Africa.

Political unrest arising from growing nationalism and policies to make strategical use of manganese ore in these countries have caused Japanese government and business leaders to map out plans to ensure a steady supply of the ore, informed sources said. International monopolies are also exercising oligopolitic control on manganese ore in these countries.

These leaders are also aware that the deposits of manganese ore on the earth will run out in only several decades.

The seven-year project, schduled to begin in fiscal 1981, will be participated in by Japan's leading steelmakers, machine manufacturers, shipbuilders, electric equipment makers and mining industries to develop a system to collect manganese ore from deepsea floors where almost unlimited amount of manganese ore deposits are believed to be available.

A remote-controlled system presently considered as the most feasible will bring up ore from the seabed to the surface, officials said, adding that the system will however, encounter high waves, strong currents and other severe conditions.

The agency has already built an explorer ship, No 2 Hakurei Maru, which is specifically designed to locate manganese ore deposits on the seabed.

The ship has been operating on high seas since the beginning of this month to locate undersea manganese ore deposits.

However, the mining of undersea manganese ore is scheduled to be governed by an international convention to be signed next spring.

Under the convention, the right to exploit undersea manganese deposits will be granted to only countries which have developed systems to tap the deposits, the official sources said.

Japan is lagging behind in this field, they noted.

The US, the Soviet Union and West Germany have been carrying on similar projects since the later half of the 1960s. France this year decided to pour ¥30 billion to develop a system to obtain manganese ore from the seabed.

CSO: 4120

END