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# Japan Report

(FOUO 35/81)



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ECONOMIC

ASPECTS OF CURRENT, FUTURE FINANCIAL SYSTEM ANALYZED

Discussion of Green-Card System

Tokyo TOYO KEIZAI in Japanese 28 Mar 81 pp 20-24

[Excerpt] Participants: A, financial reporter; B, Ministry of Finance reporter; C, economic commentator; D, company employee; O, social department reporter; P, securities department reporter; Q, stock market commentator.

Magazine staff member: Introduction of the green-card system was made into law but its position has become strangely shaky with the governing party leaders' statement that it should be reconsidered. We would like to have you analyze the behind-the-scenes developments that led to this. The most obvious development in the governing party is the pigeon-holing proposal of Political Coordination Committee Chairman Abe.

A: He says: "We were won over to the green-card system by the bureaucrats before we really understood it. When we thought it over carefully we saw that it was a big problem."

The justification for reconsidering the measure as advocated by the politicians, beginning with Abe, is that a great shift of funds from banks to postal savings has occurred. Then there was the recent money boom. All this was due to the influence of the green-card system, and if we are not careful, money will flow overseas and people may panic and try to convert money into goods. If this happens, they say, the pattern of Japanese savings is in danger of collapsing.

D: But what I am wondering is, "Why now?", when the date of execution is set for 1 January 1984. If we turn this inside out, it exposes the politicians' ignorance of economics.

A: It was the politically ignorant banks which woke up the economically ignorant politicians. When two tone-deaf people start singing, discordant notes come out everywhere.

Voting Base Is in Danger

D: When you put it that way, the reason for the reconsideration is almost the same as the bank's reasons for protesting the green card.

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A: The banks have lost every game in the series so far. With the revision of the Bank Law, Nomura Securities Company and Mitsubishi Bank had a death match and the king of the banks, Mitsubishi, lost. Then with the green card, they were thoroughly pushed around by the post office. The banks have learned a bit late how little political power they have.

Then, the presidents of the banks took about 20 Diet members each and hit them with night raids. They ran around bearing gifts.

D: And this resulted in the reconsideration idea?

A: However, the only ones who are taking the position of the banks and shouting for reconsideration are the Fukuda faction. Of course, behind the scenes, an obstinate quarrel is taking place, with the bankers and Fukuda faction against the postal savings people and the Tanaka faction. But even in the Fukuda faction, there are only a few people involved. That's because anyone who says, "I am on the side of the banks," is sure to lose his head.

D: Why is that?

A: If one announces that he is with the Postal Ministry, the special postmasters will gather election votes. In addition, the post office activities require an investment of public funds equal to that for Tokyo Electric Company in order to assemble the latest technology. Below the post office is a crowd of small sub-contractors and related manufacturers.

D: A nest of political contributors.

A: That's right. Even the securities companies, which also oppose the banks, are skillful at feeding desirable money to the politicians even though it smells bad. For example, they can make an investment using a politician's name and then declare that he has made such and such a profit and make him a present of it.

D: However, even with this difference in levels of political power, the idea of reconsideration arose within the LDP because the banks make an effort beyond their actual power.

C: That may be true. It's because the LDP was attacked by the wealthy class that makes up its voter base. "This green card is ridiculous. The bank deposit restriction was bad enough, but now we have to consolidate our accounts under one name in postal savings where we used to be able to evade taxes. What are you guys trying to do?"

A: The LDP only began to understand the size of the problems when they were harshly criticized. Up to now, the only pattern in their heads has been the antagonism between postal savings and securities companies and banks. So they thought that it was all right to take the part of the post office and securities companies with their benefits to the politicians.

But when they noticed what was happening, the green-card system was not as simple a matter as it seemed. They realized that when postal savings also became subject

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to account consolidation, the second source for the budget and Public Finance Loan and Investment Program would move elsewhere, making it difficult to collect savings. Money for the 1982 budget could not be collected from postal savings. These are the ironic conclusions that we hear now. Because of this, the Postal Ministry people are also coming out with the idea of reconsideration.

D: The politicians will use their power to grab their share of the Public Finance Loan and Investment Program money and there are other sources such as public utility expenditures. This leads to a danger of politicians losing their voting bases.

A: Actually, the postal savings interest rate was revised right after the second reduction in the prime rate last year. As proof of this, the amount of increase in postal savings in February this year fell to 65 percent of the increase for the same month last year. The feeling of crisis acted on by the banks all last year produced an opposite reaction, the idea that it might be best to deposit in postal savings while there was still time. And postal savings collected close to 10 trillion yen. From now on, because of the coming (on 18 March) third prime rate reduction and fear of the green card, there is a possibility of a sharp drop in postal savings.

C: Another real concern of the politicians is that a lot of their own hidden funds seem to be in postal savings.

Ministry of Finance Fiercely Opposed

D: In Abe's thinking, the next year will be a test period. He wants to decide whether to postpone execution of the green-card system or suspend it after watching how funds move.

A: However, if it comes to postponing or suspending introduction of the system, this will also be disadvantageous to the banks. The green-card system will not be done away with entirely. If it is postponed, people will decide to keep their money in postal savings while there is still time, and the banks will be hurt by postal savings just as they were last year.

D: It doesn't matter whether they run or fight. They get hurt either way.

C: The post office, on the other hand, has a way out even if the green-card system is instituted. An individual pension system will be started this September. With a lifetime pension at the maximum of 720,000 yen per year, one can accumulate 12 million yen. Of course, it is tax free. If it is a 5- or 10-year limited pension, with deposits made for 3 years, one can have the same amount of tax-free savings as with a time deposit.

D: In that case, is the Postal Ministry just bluffing when it says that the budget cannot be met if the green-card system is used?

C: No, not really. The money that would go into individual pensions is only a small part of the money that would be caught in the net of the green-card system. The difference from the bank situation is that, even with the green-card system, the post office still has another place for some of the money.

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B: However, postponement is unthinkable. The Ministry of Finance is not responding at all to the LDP's argument for suspension of the system.

According to the Ministry of Finance, there is already a national consensus for the need to correct the unfairness in the tax system. Initially, this was harshly criticized as a system for putting a uniform number on every citizen, but ultimately agreement was reached with the voluntary green-card system. And last March, as legal preparation, the income tax law was revised. Now that we are just waiting for the system to be carried out, the Ministry of Finance asks, how could the LDP change its mind?

The Ministry of Finance is taking this rather strong stand. Isn't Japan a country governed by law? Once a law is passed, it is ridiculous to talk about reconsidering it before it is even carried out.

D: I agree. If this is reconsidered, there will be a strong protest, especially by workers. They work and slave every day and then 100 percent of everything down to the last drop of sweat is taxed. And in spite of this, those who do not work as much are given favorable tax treatment. Why?

If these silent voices are ignored, a taxpayer's revolt may occur even in Japan.

C: That is the view of justice. But there are some things that cannot be solved by justice. It may be unpleasant, but I believe a last resort is necessary for people with a little money.

D: What do you mean?

C: By a last resort, I mean a source of vitality for people who have money. People who have thought through how funds can grow will not do anything if there is not some money to be made. I think it is a bit unfair to stamp out all tax havens and then tell the owners of small businesses, store owners, or business organizations to invest more in facilities or make speeches about more action by the private sector.

A: I believe the focus of attention from here on out will not be on postponement or suspension but on what sort of remedial measure the LDP will come up with.

Toward Serious Public Unrest

A: I think there will be a little revision.

C: If this were America, a bill would be introduced by a member of Congress. Here, attention is focused on what procedures the LDP will take.

D: But the opposition parties won't keep quiet about this.

C: No, on the green-card problem, some fluctuation is beginning to appear even in the opposition parties.



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For example, in the Democratic Socialist Party, adviser Ikko Kasuga was greatly opposed at first. With his uniquely deep perception, he judged very early that "if we support the green card, the owners of small businesses who make up our voting base will turn away from us." As expected, a terrific backlash movement is occurring now in Nagoya and Osaka. The party itself will probably have to go along with revision.

In terms of the present political balance, if a revision bill were introduced which could coordinate the interests of all parties, it just might pass.

A: The simplest proposal for revision is the one loudly advocated by the post office--to raise the nontaxable limit to 5 million yen.

The Postal Ministry says that if the green-card system is instituted as planned in 1984, postal savings will fall off sharply in late 1983. If this happens, the government will not be able to collect enough money for its budget. This is the standard argument.

C: But even as a revenue source measure, the Ministry of Finance will throw it out.

A: A strong proposal which has sprung up recently is the idea of single taxation. Under this proposal, postal savings and bank deposits would be taxed at the same rate.

D: But the Postal Ministry will not let something like this happen again. It would be like asking for a Copernican revolution.

A: No, there is more. This proposal is to set the tax rate at 10 percent. If this is done, neither the banks nor the post office can say that it is more beneficial or harmful to one side or the other. They will be facing each other in the same ring. The advocates of this proposal are calculating that even if the rate of taxation is only 5 percent, revenues will increase.

In a sense, one tax would also help to leave the last resort spoken of by Mr C.

D: However, one tax might mean preferential tax treatment even worse than what we have now.

A: That goes back to a problem of value judgment. Opinions are divided on our stance toward the vitality of Japan's free enterprise system. Is perfect equality actually best? Or should we give some breathing space to wise people with money in order to obtain vitality.

D: Suddenly I feel as if I con't have enough money or wisdom (laugh).

B: I have a slightly different opinion. I think that either postponement or suspension of the green-card system would be very difficult.

If a revision is made, the time limit is 1984. By then the atmosphere will not be right for revision.

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The second phase of Temporary Coordination Committee meeting chaired by Mr Tsuchimitsu has been established and there is a clamor for administrative reform from the entire financial sector. Mr Tsuchimitsu is enthusiastic. "If we carry out administrative reform, we can obtain enough money for the budget in 1982 even without a tax hike." Prime Minister Suzuki has also made a firm vow to carry out administrative reform. The feeling is spreading among the people that there really will not be a tax increase.

C: But it is totally impossible to avoid a tax increase.

B: That's right. Even if there is bold administrative reform and a cut in personnel. The more people laid off, the more severance pay that must be paid out. Rather than reducing spending, there will be a large temporary increase.

Even if we count up the overall profit and loss, it is clear that in the present situation a tax increase will be necessary, even with extensive administrative reform. If they rashly give the people the hope that administrative reform will not increase taxes, then turn around and raise taxes after all, there will be a fierce reaction.

D: When that happens, it will be absurd to say that the green-card system must be revised to give the rich a way to cut taxes.

B: That's why I think revision is impossible. On top of that, there is a need to reduce income taxes. With all these things happening, the public is going to be in an ugly mood starting this summer. The formulation of the 1982 budget may be impossibly difficult.

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Growth in Postal Savings

Tokyo TOYO KEIZAI in Japanese 28 Mar 81 pp 28-32

[Text] I. Why Do Only Postal Savings Grow? Overall Advantages Recognized

In playground gossip sessions in apartment complexes, the women are saying things like: "The interest on postal savings is high, isn't it? My husband's salary is paid directly to his bank account so he followed the teller's suggestion and put part of it in a time deposit there. But maybe we should change to the post office." Since last spring, this sort of conversation has been going on throughout the country.

The ordinary white-collar worker and his wife living near the city have had little to do with the post office. Especially to the person struggling to repay a housing loan, the idea of exceeding the "Maru Yu" (system for nontaxation of small amounts of savings) limit in savings was something belonging to another world.

In addition, if one said that his financial dealings were with a post office, the comeback would probably be: "You must live in a place with a lot of trees and clean air." And most people would have said that it would be inconvenient

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not to be able to withdraw from a savings account using a card near one's place of employment.

However, following the green-card (card for people with small savings accounts) commotion, interest in postal savings suddenly grew and reached fever proportions.

Stuck in a situation where wages don't rise but prices do and real income is reduced, people naturally have come increasingly to feel that even a small amount of savings should be deposited in the most advantageous place.

Even the average white-collar worker who doesn't have a lot of extra money feels this way, so the "hidden rich," who are afraid their income will be grabbed in the green-card transition after January 1984, have cast their hopes on postal savings as a tax haven.

#### Shock of Shift to Postal Savings

Financial institutions and even the Ministry of Finance, which forced the green-card system into existence in order to secure revenue, were frightened by the rapid growth of postal savings. The increase in postal savings (including interest on principal) this month was a huge 1.408 trillion yen more than last year. It was more than a medium-size earthquake. It was as if a new regional bank had been established.

The growth in postal savings in the 3 months July through September was 2,999,600,000,000 yen, an increase of 64 percent over the same period last year. The recent increase in individual savings account deposits was 5,436,200,000,000 yen (an 11 percent increase). So 55 percent of the increase was stolen away by the post office. The remaining 2.4 trillion yen was divided among private financial institutions, but their growth rate was the worst ever. Except for the credit unions which fought well and had only a 1-percent reduction, all others, including city banks, regional banks, mutual banks, trust banks, the fishermen's cooperative, and labor union funds, suffered reductions in growth rate from 20 percent to more than 30 percent.

Resentment against postal savings was voiced in all financial institutions. Attacks on paper were made and distributed by everyone involved under the leadership of the National Federation of Bank Associations (chairman, Shun Yamada, president of Mitsubishi Bank) with titles like "Postal Savings Tyranny," "Postal Savings--Breeding Ground for Tax Evasion Savings Accounts," and "Examples of Illicit Solicitation." Also, a frontal attack was made in a debate over the state of government and industry.

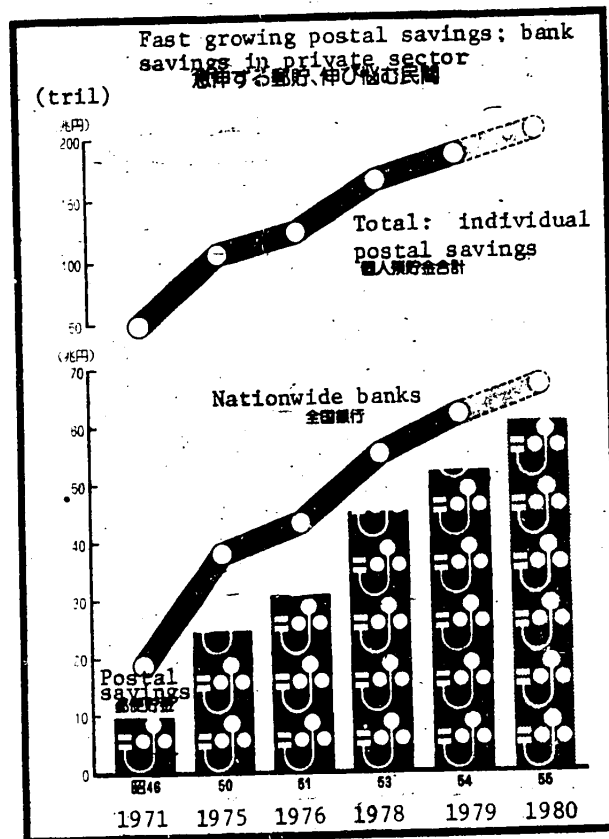
#### Dramatic Fall in Banks' Position

The seemingly hysterical enmity of banks toward postal savings is inevitable in certain respects. That is because the sudden increase in postal savings is not a new event dating only from the beginning of last year.

As can be seen in the graph presented below, the share of individual savings accounts held by postal savings has grown year by year, from less than 20 percent

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in 1971 to 29 percent at the end of September 1980. Compared to this, the share held by banks throughout Japan (city banks, regional banks, long-term trust banks, etc.) has fallen from 38 percent to 33 percent.



The overall volume of increase in postal savings is dramatic. Total postal savings first reached the high plateau of 10 trillion yen in June 1972. It had reached 1 trillion yen 12 years before, so the rate of increase during this period was slow.

However, after that things speeded up: 20 trillion yen was reached in only 3 years (June 1975), 30 trillion yen in less than another 2 years (March 1977). It took only a little less than a year and a half to grow to 40 trillion yen (July 1978) and about the same to reach 50 trillion yen (January 1981). This January, it will break 60 trillion yen, a growth of 10 trillion yen in only 1 year.

It is easy to say 10 trillion yen, but there are only six banks which exceed this volume of funds--Daichi Kangyo, Fuji, Sumitomo, Sanwa, Mitsubishi, and Kogyo. And for the banks, this includes corporate accounts and securities. No private institution can assemble 10 trillion yen only in savings accounts, and that in

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1 year. And when banks are forced to take on national bonds as an aid to the government, one can understand why their hatred of postal savings is growing.

Preferential Treatment in Interest and Taxes

So then why has this avalanche of funds come into the postal savings system?

The first reason is advantages in interest. The regular postal savings account has a better interest rate (4.08 percent annually) than an ordinary bank deposit (2.75 percent annually). The rates for the 1-year time deposit and the fixed-amount savings deposit are equal, at 7 percent. When we compare the chief strength of the banks, the time deposit (7.25 percent for 2 years) to the fixed-amount savings deposit of the post office (7.25 for 3 years or more), the banks seem to have a favorable position.

However, the fixed-amount savings account, which has a 10-year limit, has interest compounded semiannually and the interest rate grows progressively as the period of deposit lengthens, up to 3 years. Then the high interest applies retroactively back to the time of the initial deposit. Just before the third reduction in the prime rate, the annual yield on a 10-year fixed savings account was about 11 percent. In reality the bank cannot possibly offer a better product.

The second advantage is the preferential tax treatment. Up to 3 million yen are exempt from taxes in a postal savings account. The banks' "Maru Yu" deposit (3 million yen limit) must be reported to the tax office and the amount exceeding the limit is, of course, taxed.

There is a large difference between systematic exemption from taxation and inclusion in the tax return. By using this system illegally, many people have made illicit deposits to evade taxation. For example, one person opened 70 accounts and deposited a total of 150 million yen in them. A former postmaster deposited 170 million yen in 1,000 separate accounts.

It is perhaps inevitable that the angry banks will make accusations. "More than 30 percent of the 60 trillion yen in postal savings accounts is there for tax evasion. Postal savings solicits accounts by printing 'safe, profitable, secret, no report necessary' on its business cards and by passing out handbills that offer a 2,000-yen gift certificate for a 1-million yen deposit. It is totally unfair."

Regional Affiliation Used as a Weapon

A third advantage is the strong foundation of postal savings. At the end of 1979, there were 21,810 post offices, including very small offices in every area from remote mountain valleys to the largest cities.

In comparison, there were only 12,414 bank branches, or if trust companies and credit unions were included, just over 20,000--a big difference.

Also, in the post offices, there are about 10,000 "external affairs personnel" who specialize in obtaining savings accounts. These salesmen have a system of

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strong local ties so they can drop into people's homes and chat over tea. This can function as a "vote-getting machine" when necessary at a moment's notice, so politicians do not mistreat the "postal family."

The postal savings system has grown rapidly both because of its overall fighting strength--interest and tax advantages and network of outlets--and its attractiveness as a tax haven. In these aspects, there is much truth to the bank's accusations of "preferential treatment of postal savings." On the other hand, it cannot be denied that there are other aspects, thoroughgoing service and understanding of the people's feelings, which the banks have neglected.

II. Secret Strategy To Become World's Largest Bank? Advance Into Lending by the "Post Office Public Corporation"

The postal bureaucrats always have these words on their banner: "Postal savings is the savings institution for the people." According to a public relations pamphlet recently produced by the Postal Ministry, "The Housewife's Consciousness of Financial Institutions," 88.4 percent of the persons questioned said that the post office was "people-oriented." This was much higher than the figure of 71.2 percent for banks. And they congratulate themselves that the post office has a much better reputation in other areas as well: "hard to use" (post office, 9.3 percent; banks, 12.6 percent), "self-centered" (post office, 4.6 percent; banks, 11.4 percent), "different attitude at deposit time and withdrawal time" (post office, 7 percent; banks, 48.1 percent).

Certainly, one gets angry at the unpleasantness of banks when one withdraws a time deposit early or asks for a loan. If banks are to proclaim that "we place importance on the individual," this is something that should be corrected right away.

However, in asking whether the relationship with depositors is "people-oriented" or not, we should look at the matter on a different level. Postal savings is oriented toward the people in its original intention of gathering small savings accounts and heightening the consciousness to save. However, today, when examples of tax evasion appear continuously and the postal savings system is using this as an attraction to spur growth, we cannot be convinced that they are operating out of concern for common people.

With this background, the green-card issue came up and the majority of the people hoped for a correction of the unfair tax system. There must be many who feel the difficulty of closing the gap between the public pretense of "the people's financial institution" and the reality of "a refuge for the rich."

In the Diet, for example, there has been this response: "We will take a scalpel to illicit savings accounts." But if there is no direct response to the doubts mentioned above, one becomes willing to take the side of the banks in their call for "equal footing." If the politicians who want to appear to be on the side of the people assemble the power of over 250 Diet members and haphazardly spur on the expansion of functions of the Postal Ministry, the suspicion arises that interests unrelated to the people are involved.

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Because of this, it is necessary for the Ministry of Posts and Telecommunications to open up and give more information to the public.

Postal Ministry Skilled in Negotiations

The actual stance of the Postal Ministry is an increasing ambition to expand its jurisdiction.

In September, an individual pension system, a form of postal insurance, will be put into effect over the protest of private life insurance companies. The annual limit of the pension will be 720,000 yen, much greater than the average private figure of 300,000 yen.

The Postal Ministry coldly put off the protests of other institutions. "They have neglected not only individual pensions, but personal finance as well. This advance of the post office should be a stimulus to them." They even say: "It would be fine if the private sector started a new type of compound interest account to compete with our fixed-amount savings account with compound interest."

Even though some of these statements strike home, there are some things that are not as simple as they appear on the surface. Looking at the previous pattern of Postal Ministry action, we see that when they ask for something from the private sector, they plant bombs for security.

This came out in extreme form in the negotiations over individual pensions. In the initial proposal, the amount of the pension was 2.4 million yen. This was ultimately reduced to 720,000 yen, so it was a "big concession."

In the interpretation of the private sector, "The original figure was ridiculously exorbitant, so this was no concession. It was a major victory for the enemy." This kind of apprehension can be felt in many other areas.

One example is the "silver savings account" idea, tax exemption for up to 10 million yen for savings of heads of households over 50 years of age. The declared pretense is that this is for retirement planning in a society that is growing older. However, it is highly probable that this will be used as an effective means to make up for the shift to the green-card system.

In addition, there are plans to introduce new services starting in 1981 such as combined deposits, automatic bill-paying, instantaneous telegraphic transfer, etc. At the end of March, computer centers in Tokyo, Utsunomiya, Osaka, Nagoya, and Hiroshima will be set up on line with 7,192 post offices. By the end of 1983, a network of 20,000 post offices throughout the country will be completed.

This on-line system will deliver a severe blow to banks, which have mainly dealt with household finance transactions. In terms of bringing in funds, this will be an even more effective weapon than the tax and interest advantages.

Why is the Ministry of Finance, which is supposed to be the guardian of the private financial institutions, unable to make an effective counterattack to the instincts of the post office toward proliferation?

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Sponsor of Second Budget

There are many reasons, but the main one is the financial power of the post office. The Public Finance Loan and Investment Program (1980), which is known as the second budget, has a huge amount of funds, more than 18 trillion yen, and 96 percent of the base funds are Trust Fund Bureau funds. The largest sponsor is the Postal Ministry, which puts out 9.592 trillion yen from postal savings and postal insurance combined. This "debt" carries great significance.

The earnest desire of the post office is to gain autonomous control in investing and using these funds. The Ministry of Finance, on the other hand, is determined not to give the right to the Postal Ministry to use the funds placed in the Trust Fund Bureau, which is tied to the Financial Bureau. As long as the post office does not enter this sacred ground, the Ministry of Finance will continue to make concessions to their belligerent moves.

With respect to the rapid growth of postal savings, theories abound concerning uneven distribution of funds in favor of government enterprises and reevaluation of government enterprises. The private sector claims that uneven distribution of funds toward the government sector prevents the smooth flow of money to the private sector, especially the manufacturing industries, and destroys private sector vitality. This view is correct, with no room for argument.

Right now, the Postal Ministry is taking this attack lightly. But Postal Ministry bureaucrats are known for their persistence, and they are thinking: "If the private supply of funds dries up, then we can make loans." They are waiting for a chance to provide assistance.

When that time comes, it will be the perfect chance to advance the concept they have long had on the back burner, a "post office public corporation." The ultimate goal of the Postal Ministry people is to change from half a "bank," which has only savings accounts and can put only part of its funds into loans, into the world's largest bank, in both function and name, with comprehensive activities of raising funds and employing them.

III. Unification of Interest for Whom? Postal Savings Discussion Group--Many Problems Amid High Hopes

The postal savings discussion group was created at the end of last year in a trade off for realization of the individual pension plan. It will be a forum for testing the great plans of the Postal Ministry. It is a personal advisory body for the prime minister and its formal name is the "Discussion Group on the Status of Government Enterprises in the Field of Finance" (chairman, Hiromi Arisawa, professor emeritus of Tokyo University). As the name indicates, it deals with concentration of funds in government enterprises, the function of government enterprises, and unification of interest, etc. The five members of the group are all influential people.

The current focus is on the problem of interest unification. At present, there are two levels--interest on savings accounts is determined by the Postal Services Advisory Council and interest on bank deposits is determined by the Interest



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Adjustment Council. The resistance of the post office to reducing interest is particularly strong, and there are many difficulties in regulating interest.

Even the Bank of Japan, which is the supervisor of monetary policy, has announced: "The shift of funds to postal savings has narrowed the range of monetary policy and weakened mobility," beginning to wave a flag attacking the post office.

Then the National Bank Association organized a group of scholars known as the "Public and Private Sector Study Group" and commissioned it to thoroughly reexamine the postal savings problem.

In all these moves, the aim is to use interest unification as a lever to put public and private institutions on an "equal footing" and secure a more ideal condition in the government enterprises and better monetary policy from the point of view of the people's economic situation in a period of low growth.

PR Battle Planned for August

The Ministry of Posts and Telecommunications considers that if others enter the sacred precinct of determining interest on postal savings, not only will postal savings stop growing rapidly but there is a danger that the overall balance will drop. Therefore, they have quickly established the Special Committee for Fundamental Post Office Problems in the Postal Services Advisory Council (chairman, Toshio Tsuchimitsu) and moved to counterattack in the battle of words. The LDP Communications Committee also organized a subcommittee which exhibits strong characteristics of a cheering section for the post office.

The report from the postal savings discussion group is scheduled for submission in the middle of August. However, the committees of all parties will present reports clarifying their views in May and June and will direct public relations efforts toward the members of the postal savings discussion group.

The members of the postal savings discussion group are complaining: "Between the screams of the players on both teams and the shouts from the stands, the commotion is unbearable."

In the Diet, questions like the following are flying about: "Won't unification of interest work against interest liberalization? The problem of interest unification has been debated for many years. It is disgraceful to ask for a decision in August." (Akira Nakano, Komeiti Diet member)

The argument that unification of interest will go against interest liberalization is also the view of the Postal Ministry. However, this argument is based on a misunderstanding. Liberalization has the aim of reflecting the market mechanism. The existence of two artificial interest systems is even more antithetical to liberalization.

Since vested interests are clashing openly over this issue, it is not certain that a clear conclusion can be reached in August. And there are many other problems of differences in thinking. The Bank of Japan and the Ministry of Finance are fighting together on the side of uniform interest, but once it is

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adopted, the problems will remain of which one is to have leadership and what sort of monetary policy to adopt.

The postal savings problem has been likened to the Hundred Years War. The vested interests of the parties involved have thick walls and deep foundations. The postal savings discussion group has been handed an effective scalpel by a thousand-in-one chance. Attention is focused on whether it can wield it with the skill of a great surgeon in response to the great hopes which are placed on the group.

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Risk of 'Financial Socialization'

Tokyo TOYO KEIZAI in Japanese 28 Mar 81 pp 33-35

[Text] I. Proliferation of "Government Officials Labor Federation"

The postal savings problem has been debated from many angles. These include the problem of an unfair tax system, problems in new products and services, and problems of determining interest rates. Each of these should be examined carefully, and honest evaluation should be given its due. However, this author believes that there is great danger of sticking exclusively to this debate while the actual problem continues to grow now. This is because there are many respects in which the overall patterns and internal nature of the problems cannot be grasped in a partial and technical debate.

From this point of view, the first thing that should be observed is that the expansion of postal savings is not a unique phenomenon that occurred in isolation. The postal savings problem occurred together with the expansion of public sector intervention in the private sector in financial affairs. Expanded intervention has occurred, first, by quantitative and qualitative expansion of government financial institutions, and second, by increased public intervention in private financial institutions. The former aspect is seen, in the area of fund procurement, in the expansion of postal insurance and pension funds as well as postal savings, and in the area of fund employment, in the expansion of the public finance loan and investment program. The latter includes the strengthening of regulations and guidance based on the pretext of the "public nature" and "social responsibility" of banks.

This expansion of intervention, or in other words, financial socialization, is advancing in the form of competition with or pressure on private financial institutions. And in the background, I believe, is self-proliferation of a "government officials labor federation" including not only the employees of government financial institutions, but the politicians of both governing and opposition parties, who use them as an effective base of support.

This socialization of finance is not just a life-or-death issue for the private financial institutions. It is a problem involving selection of the overall economic system. If financial socialization continues to spread, financial restrictions will gradually cause private industry to lose its vitality and

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resilience and force it closer to the public corporations of the big boss, the Japanese Government. Finances are being used as a device to socialize the entire economic system. This is the path of "financial socialism."

In spite of this, however, financial socialism is making gradual progress as a fait accompli without fundamental debates, judgments, or decisions ever clearly taking place. This means that the special interests of the "government official labor federation" are proliferating without being checked from the point of view of the entire economy. In other words, special interests have taken precedence over the pursuit of the general interest. This is where the greatest problem lies.

The phenomenon of special interests taking precedence over the general interest is not at all peculiar. It is the most common danger that a democratic society is prone to and something which has been emphatically pointed out by scholars in recent years.<sup>1</sup> The gradual socialization of finance did not result haphazardly from a special or temporary state of affairs. It is the appearance of a flaw in democratic society itself. Therefore, it cannot possibly be stopped by temporizing measures or arguments.

II. Creeping "Financial Socialism" [Author: Iwao Kuroda, assistant professor, Tsukuba University]

The socialization of finance has a decisive influence on the state of macro-stabilization policies. As the government financial institutions expand, monetary policy which ignores the direction of socialized sectors will meet with more and more difficulty. This means that a central body to control the socialized areas will become necessary in addition to the central bank, the organ that executes macrostabilization measures. Recently, "unification of interest policy" is being loudly demanded. On the surface, this appears to be a jurisdictional dispute between the Ministry of Finance and the Postal Ministry. But we must not forget that such a jurisdictional dispute has become a big problem because Japanese finance has become socialized to the point where the central controlling organ that executes the macrostabilization policies mentioned above has to be reinforced.

If the socialization of finance continues to expand, it will become impossible to maintain the stability of the macroeconomy through the monetary policy of the Bank of Japan, and the government will have to take its place as a regulating agency. This is because the monetary policy of a central bank is carried out by some form of action on the activities of private financial institutions. However, as the weight of private financial institutions is decreased and their operating base is weakened through the socialization of finance, the measures which smoothly regulate the overall economy through these channels are no longer effective.

Especially if the self-propagating government financial institutions combine the regulatory organs and come to have great influence on them, there is little hope

<sup>1</sup>M. Friedman, "Freedom of Choice," Ch 10.

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that regulation will be determined rationally with a view to overall welfare. This is because when the overall welfare is balanced against the special welfare of the government financial institutions, the latter will tend to take priority.

A fundamental debate going beyond technical considerations is necessary to deal with this problem.

These days, public opinion generally comes down hard against expansion of the public sector. The kind of fundamental debate indicated above is included in this. The socialist society which was previously attractive to intellectuals has recently become a negative symbol. In the United States and Europe, as indicated in the new Reagan policies, the desire to reduce the size of the public sector is growing stronger among the common people as well as among scholars. The same kind of movement is beginning in Japan when financial reconstruction is being planned chiefly by means of a tax increase.

### III. Intellectual Climate Allowed Socialization

However, these voices are not being directed toward the socialization of finance. This is due to the general level of consciousness of finance and the intellectual climate of the academic disciplines which influences it strongly.

The first thing that should be pointed out is that a fixed idea still exists that Japan's private financial institutions work irrationally in line with unique Japanese banking and business practices and unique Japanese regulations. As long as this premise is accepted, no matter how undesirable the recent socialization of finance phenomena may be, the influence of socialization itself is underrated as just a switch from one irrational system to another.

In reality, there is very little evidence for this theory of uniqueness.\* On the basis of a uniqueness theory with little supporting evidence, the effect of financial socialization is underrated and a force occurs which is overlooked.

The second point that should be made is that scholars and economists have not actively attributed significance to the existence of private financial institutions. The image of banks as a great evil, coming from the monetary capital theory of Marxist economics, is still strong.

Modern economists, on the other hand, see financial institutions as mediating in saving and investment and supplying currency. They do not offer a positive explanation of why this must be done by private financial institutions. For example, private financial institutions have always competed on the basis of investigative and organizing functions, and this has brought about vitality and resilience in the public sector. These functions are never mentioned in conventional textbook theory. A one-sided monetary theory naturally gives little importance to the private financial system. In fact, it contributes to misunderstanding.

\*The author, "Reconsideration of Japanese Monetary Policy," Economic Studies, Hitotsubashi University, January 1981.

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The third point is that modern economists especially are severely critical of private monopoly but tend to be tolerant of public monopoly. (This is not limited to finance.)

The Anti-Monopoly Law which prohibits private monopoly is a development from the common law. In other words, under the principle of the rule of law, the giant public sector is to be regulated first and then the same thinking is to be applied to private monopolistic organizations. However, modern Japanese economists, without being aware of or sufficiently examining this consistent concept, have been oddly diligent in demonstrating the economic harm caused by private monopoly only.

Moreover, the theory that the public sector should always be free and able to maneuver as it sees fit (the theory named after the Keynesian, Harvey Road) was accepted until recently as only natural. When this problem is added to the first two, we see that financial socialization is not just underrated in its harmful aspects. It is given a positive evaluation as a matter of course.

#### IV. Active Effort Toward a Fundamental Debate

As I have stated, the predominance of special interests over the general interest is a danger to which a democratic society is prone. In order to escape this, it is essential that a public opinion be formed that is clearly aware of the distinctions and contradictions between special interests and the general interest. And for this purpose, it is necessary that there be a change in general consciousness and in the intellectual climate.

There are many reasons why this is not taking place, but I believe the first problem is that those who stand to be directly affected by financial socialization have basic misunderstandings or are being naive about the points made here.

Active effort is necessary to obtain the theoretical equipment to reform consciousness and the intellectual climate examined in section III and to appeal to public opinion to recognize the existence of the basic problems discussed in sections I and II.

Of course, theoretical equipment and appeals will not solve everything. If those involved are to proclaim the advantages of financial socialization, an effort will be required, along with explaining their own actions, to make necessary changes and clear up areas that cause misunderstanding in addition to dealing with immediate problems.

The recent movement of gradual financial socialization was originally triggered by rapidly rising prices and the accompanying increase in criticism of banks. The wounds remaining from the wild price hikes are long and deep. The continued maintenance of macrostabilization policies is a necessary condition for rational and clear discussion of the basic problems involved in financial socialization.

As I have stated above, the most important thing to be done in relation to the postal savings problem right now is to have a wider debate among the citizenry

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on the fundamental problem of financial socialization. For this purpose, it is necessary to take care to avoid words or actions which present an incorrect image to those who will be directly harmed by socialization and to make active efforts and take measures to dispel misunderstanding.

We should remember that without such an effort, repeated partial or technical arguments and responses will only aid the process of gradual financial socialization.

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Reexamination of Green-Card System

Tokyo TOYO KEIZAI in Japanese 28 Mar 81 pp 36-37

[Text] The green-card (small savings account card) system is to be instituted in January 1984. Arguments opposing it are springing up fast. The main reason for opposition is that if this system is pushed through, hidden funds and money which has evaded strengthening of the tax system will flee overseas or go to precious metals or paintings. It is held that this would not only have a big effect on Japanese financial markets, but also lead to an inflationary mentality of exchanging money for goods. The opposition movements are coming from small businesses and industry and from politicians.

Observing these movements, most citizens are likely to be angry. This is because they see right away that the reason for the protest is that funds hidden to evade taxes will be exposed and illicit political contributions will be harder to hide. Therefore, it is only natural that the average wage earner, who has no illicit contributions to hide and has his income tax collected at the source, strongly feels that this system should be resolutely carried out and the wrongdoers should be strictly controlled.

As of the present, Prime Minister Suzuki and other government officials have not changed their policy of carrying out the initial plan for the green-card system based on the pretext of correcting unfair taxation practices.

We do not believe there is any necessity to protect the hiding places of the rich and the politicians and we do not think there is any reason to listen to their pleas. But we would like to point out that the issue is too complex to be solved simply by emotional arguments. We believe this system is problematic because of the very small positive effect to be gained from the tremendous energy output and friction that will go along with instituting the green-card system. Since this problem is very closely related to the life of the nation, it deserves rational study and we think that it is now necessary to reconsider the green-card system.

Positive Effects

First, what are the advantages to be derived from the green-card system? It goes without saying that its major purpose is to eliminate preferential treatment of the rich in the tax system. Heretofore, when the rich selected divided taxation

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at source for their interest and dividend income, the tax rate was 35 percent and it was not necessary to pay any regional taxes. If there is a shift to comprehensive taxation, a high tax rate will be applied and regional taxes will have to be paid.

On 11 March in the House of Councillors Budget Committee, Finance Minister Watanabe reported the expected increase in tax revenues following introduction of the green-card system. Based on the tax revenues of 1981, the increase in income tax revenue will be 70-80 billion yen and the accompanying increase in local residence tax revenue will be 120-130 billion yen, for a total of 190-200 billion yen. The expenses for instituting the system, on the other hand, will be approximately 2 billion yen annually, so the actual increase in government revenue will be 170-180 billion yen.

This amount of money will be obtained as compensation for a tremendous expenditure of energy. Leaving aside for the moment the question of whether it is really enough, we should look next at the disadvantages of introducing the green-card system.

Negative Effects

The first problem is that it is very doubtful whether the tax revenues will increase as planned. The rich are worried about exposure of the previous hiding places for their income more than they are worried about a small increase in the tax on their interest and dividend income. Therefore, the money presently in these hiding places will flee overseas or move to ordinary bank deposits not covered by the green-card system. As a result, the amount of money that was previously taxed at 35 percent will decrease, and because of this reduction in deposits subject to taxation, the increase in tax revenues may be much smaller than planned.

Second, even if this system is instituted, the feeling that the tax system is unfair will not disappear. This is because the greatest cause of a feeling of unfairness is the 9-6-4 difference in income supplement rate between salary income, business income, and agricultural income. Even if the tax on interest is manipulated to some extent, the feeling that taxation is unfair will not disappear as long as this basic inequality persists.

Third, even if there is sufficient consolidation of bank deposits and savings accounts under one name with the green-card system, it will be impossible to check discount bonds and dividends sufficiently, and this will lead inevitably to new sources of inequality related to financial assets.

Fourth, when this system is introduced, fierce competition will develop among the banks to get "Maru Yu" accounts filled. It will probably be worse than the competition in newspaper sales. The well-intentioned average depositor will be drawn into this whirlpool of excessive competition.

Fifth, there are 300,000 people who come under today's 35 percent rate for divided taxation at source. In order to prevent illicit use of the "Maru Yu" system by this small group of people, it will be necessary for the other 100

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million people to get a certificate of residence and go out of their way to present a card when making a time deposit. This involves tremendous inconvenience and expenditure of energy. And the only result for the average depositor will be this inconvenience with no increase in actual benefits.

The sixth problem is the effect on the national economy. Last year a great deal of money shifted to postal savings because of the green-card system, and this caused a lot of harm in the financial market. If a large amount of money goes overseas in the near future, it will lead to stringency in the financial markets. If there is a big move to change to bank deposits, banks will have reduced financing costs but problems in securing stable long-term funds.

Urgent Reconsideration Needed

While there may be a need to correct an unequal tax system for the public good, the problems listed here are likely to occur. Is it really necessary to pay such a high price to obtain a mere 100 billion yen in extra tax revenues? Finance Minister Watanabe stated at a press conference following the cabinet meeting of 13 March that there would be a great burden on people with high incomes resulting from the introduction of this system. He said he would like to take steps to alleviate this because compared to other countries such as Great Britain, we have an extremely high tax rate on high incomes.

There is nothing to be gained. The effect of increased tax revenues following introduction of the green-card system will be further diminished by a reduction in the income tax rate.

It is essential that the green-card system be reconsidered soon, before immeasurable adverse effects are brought about in the financial markets. We would like to discuss the specific measures to be taken at another opportunity.

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SCIENCE AND TECHNOLOGY

GDR CHAIRMAN ASKS JAPANESE COOPERATION IN ADVANCED TECHNOLOGY

Tokyo NIHON KEIZAI SHIMBUN in Japanese 12 May 81 p 1

[Article by special correspondent Murase in East Berlin: "GDR Chairman Met With Japanese Reporters Before His Visit to Japan; Cooperation in Advanced Technology"]

[Excerpts] Erich Honecker, chairman of the East German Council of State and secretary general of the Socialist Unity Party (the Communist Party), who will pay a formal visit to Japan on the 26th for 1 week, met with the Japanese press group on the 11th in East Berlin. At the interview, he stated his hopes for his first visit to Japan.

He expressed his satisfaction with the fact that the economic cooperation between East Germany and Japan is steadily progressing. At the same time, he stated that "he would like to rapidly introduce microcomputers and robots because East Germany suffers from a serious labor shortage." He strongly suggested that East Germany needs Japan's cooperation in this respect.

With regard to the relationship with Japan, he greatly appreciates that the trade volume between the two countries doubled during the past 4 years between 1977 and 1980, and stressed that "it is possible to maintain peaceful coexistence and economic cooperation even between countries with different political systems."

He showed his satisfaction with the fact that Japanese enterprises have participated in East Germany's major projects and the two countries have increased their cooperation in the Third World's market. He showed a positive attitude toward introducing Japanese advanced technology into East Germany. He pointed out that an improvement in productivity is especially indispensable for East Germany's economic development, and asked for Japan's cooperation in the fields of microcomputers and robots.

Also, Chairman Honecker disclosed that East Germany had an annual economic growth of 5 percent in the last five-year plan which ended in 1980. He stressed that "East Germany plans to achieve an annual 5.5-6 percent of economic growth in the next five-year plan."

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SCIENCE AND TECHNOLOGY

TITANIUM PRODUCTION IN JAPAN RAPIDLY INCREASING

Tokyo NIKKAN KOGYO SHIMBUN in Japanese 16 Mar 81 p 7

[Article by Masao Aoyama, the journal reporter; "an annual 50,000 ton production; Osaka Titanium Co., Ltd. has an aggressive plan; new demand will still continue"]

[Text] Osaka Titanium Co., Ltd. (headed by Yasubumi Doi) announced its intention to "produce 50,000 tons of titanium per year," in "responce" to the military build-up by the Reagan administration.

A 50,000 ton per year production is about the level of production in the Soviet Union, and is more than sufficient to satisfy the demand in the free world. Osaka Titanium has the ambition to satisfy the free world's demand alone. It is reported that Toho Titanium Co., Ltd., the second largest titanium producer in Japan, is examining the possibility of a 50% production increase. In addition, Mitsubishi Metal Corp. backed by the Mitsubishi Group is studying whether to begin titanium production. Thus, activities in the titanium production industry are very lively. Despite the dull activities in both the ferrous and non-ferrous metal industries, only the titanium market is energetic. The reasons why the Japanese titanium producers are so aggressive in production are examined here.

Osaka Titanium announced on 3 March that it will invest 12 billion yen to construct a plant with a 12,000-ton per year capacity. The plant is expected to have a capacity of 5,000 tons by December 1981, and another 7,000 tons some time later. Osaka Titanium will be the world's largest titanium producer, if the new plant is completed, and will produce a total of 27,000 tons per year. President Doi "declared" also that "the company is establishing a system so that it will be able to produce up to 50,000 tons in future." The reason behind this is that the company is expecting the rapid increase in the demand for titanium due to the increase in production of commercial aircraft, nuclear generation facilities and medical equipment, and is planning to build the world's largest titanium export base through reducing the production cost by means of the most sophisticated plant and equipment. While it is stepping up the production of titanium sponge, Osaka Titanium is constructing an ingot smelting furnace. When completed, it will produce 200 tons of ingots per month. Thus, the company is extremely aggressive in establishing a comprehensive production system.

Titanium is heavier than aluminium, weighs half that of copper or nickel and is twice as strong as iron. Besides, it has such superior characteristics as high heat and corrosion resistance. The titanium market, however, is always violently

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affected by the business conditions. Two thirds of the titanium demand derives from aircraft production. The volume of military aircraft production especially affects the titanium demand. Only a few years ago, all titanium producers suffered severe financial difficulties because of the reduction in military expenditures in the U.S. and Europe and reduced demand for commercial aircraft production due to a recession in the airline industry. Adding to their difficulties, the Soviets dumped titanium at a low price on world market and the titanium producers were hit with large increases in electricity charges. All producers, including Osaka Titanium and Toho Titanium, together with TMC and RMI of the U.S. fell into the bottom of a recession. Also, because titanium sheet makers, such as Kobe Steel, Ltd. and Sumitomo Metal Industries, Ltd., had heavily invested in their plants and equipment prior to this period, the financial damage was the worst of any recession that they had ever experienced.

The situation has completely changed since 1978. The Soviet Union, the world's largest titanium supplier, which gave great trouble to the Japanese titanium industry with its low sales price tactics suddenly stopped the export of titanium to the free world. It is said that the Soviets are making nuclear submarines which are totally made of titanium and sail at 40 knots at 3,000 feet in depth, or that they are developing a new type titanium tank to replace the T-72 tank, but the true reasons are not known. The Soviets involved in the titanium production gave "no comment" to any question directed toward them. Naturally, purchase orders are coming to Japan more frequently and the price is rising from 2-3 dollars to 7.5-8 dollars per pound (3 million yen per ton). Kobe Steel, which is the top processor of titanium sheet is receiving purchase orders from practically every aircraft manufacturer in the United States and in Europe, including Airbus, Rolls-Royce, and Pratt and Whitney. Such is the titanium fever phenomenon. At this time last year, many people were saying in spite of the titanium boom that "we never know how long this boom would last," or "the Soviet Union may start dumping again soon enough." At that time, even Vice President Minkler of TMC, who has a 30-year experience in the titanium business, took a pessimistic attitude toward investment in plant and equipment, saying that "I cannot believe that good business activity will last for long." Even now, however, the high price and high demand for titanium are continuing. Regardless of the pessimism on the part of the U.S. and European titanium producers, the two Japanese producers have each aggressively expanded their production by 100%--to 15,000 tons at Osaka Titanium, and to 12,000 tons at Toho Titanium. Their tactics have certainly proven successfully.

The factor which gives impetus to this boom is the fact that President Reagan has revived the idea of building new military aircraft and has been working on Japan and NATO countries to expand their defense forces. The F-15J, the FX, which is made by McDonnell-Douglas is 30% titanium. It is said that the aircraft which is to replace the B-52 will use more titanium than the B1 (120 tons for the fuselage, 10 tons for the engine) which was considered as the candidate for the B-52 replacement during the Carter administration. Both aircraft are like a chunk of titanium. Additionally, the production of Boeing 747's and 767's and other commercial aircraft will inflate the demand even more. It is natural that the producers have become all excited. Osaka Titanium (the Sumitomo Group) and Toho Titanium (the Nippon Mining Co., and the Mitsui Group), which are the forerunners in the field, are planning on expansion, and Mitsubishi Metal, which has talked about beginning titanium production for some time is studying the possibility of joining the

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business. Mitsubishi Metal enthusiastically stated that "we will complete our study within this year on whether we will join them or not." However, it is said that the "50,000 ton" remark made by Osaka Titanium is meant to be a diversionary tactic against Mitsubishi Metal. In any case, the titanium industry agrees that as far as the international tension centering around the U.S. and the Soviet Union continues, the demand for titanium will continue to be high. Titanium demand by commercial aircraft, sea water desalination facilities and nuclear reactors in addition to military aircraft is high, however, if the price goes down, there is a possibility for development of new products. There is a voice which counsels those who are ecstatic about the titanium boom, that "we must do our best in cultivating new fields and developing new technologies at the very time when we can afford it."

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SCIENCE AND TECHNOLOGY

MITSUBISHI METAL CORPORATION TO START PRODUCING TITANIUM WITHIN 3 YEARS

Tokyo MAINICHI SHIMBUN in Japanese 24 Apr 81 p 7

[Article: Mitsubishi Metal Corp. to produce titanium; 500 tons per month, within 3 years]

[Text] Mitsubishi Metal Corp. (headed by Yoshihiro Inai) announced on 23 April that the company will start producing titanium within 3 years. The company decided to venture into the Titanium producing field because titanium demand is expected to grow continuously. The company expects high demand in the fields of weaponry, aircraft, nuclear generation and desalination facilities. There are some members of the Mitsubishi Group such as Mitsubishi Heavy Industries and Mitsubishi Electric Corp., which strongly demanded the production of titanium within the enterprise. Both the Mitsui and Sumitomo groups already include titanium producers among their members, and with the participation of the Mitsubishi group all three of the old financial combines will be participating in the titanium industry.

Increased Demand for Titanium Because of the Production of Weapons and Aircraft

According to Mitsubishi Metal, it plans to use ilmenite ore, which contains only 50% titanium but is cheap, instead of lutile ore, which contains 90% titanium but is expensive. The company will refine the ore in two steps: refining ilmenite into artificial lutile ore and then into titanium. Currently, Mitsubishi Metal is negotiating with DuPont of the U.S. for technology transfer, but it also has good prospect for producing titanium with its own technology.

Also, Mitsubishi Metal plans to diversify the means of ore acquisition through securing titanium tetrachloride from chemical plants which belong to the Mitsubishi Group, including Mitsubishi Chemical Industries Ltd., which produces it as a by-product. Mitsubishi Metal also plans to manufacture titanium plate and pipe at its Okegawa factory. It plans to start titanium production "within 3 years" (President Inai), and the production scale is scheduled to be 500 tons per month.

Titanium has the following characteristics: 1) it is slightly heavier than aluminium but weighs half as much as copper or nickel, 2) it is twice as strong as iron, and 3) it has high heat and corrosion resistance. Therefore, the demand for titanium has rapidly increased during the last few years mainly in the aircraft, nuclear submarine, thermal and nuclear power generation and sea water desalination industries. Consequently, price has jumped to about 3 million yen per ton.

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In Japan, there are two titanium producers, Osaka Titanium (the Sumitomo Group, with a 15,000 ton annual production capacity), and Toho Titanium (Nippon Mining Co., Ltd. and the Mitsui Group, also with a 15,000 ton annual production capacity). Thus, the domestic production capacity totals 30,000 tons. The Japanese annual production capacity surpasses that of the U.S., which is now at 22,000 tons. Japan is the world's second largest producer, following the Soviet Union, which is said to produce 35,000 tons per year. Because of the rapid increase in demand, Osaka Titanium also plans to increase its production by 12,000 tons per year. If Mitsubishi Metal participates in the business, Japan will surpass the Soviet Union and will become the world's largest producer of titanium in a few years.

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SCIENCE AND TECHNOLOGY

STUDY OF LIQUEFIED HYDROGEN FUEL FOR H-1 ROCKET PROMOTED

Tokyo NIKKEI BUSINESS in Japanese 12 Jan 81 pp 76-78

[Interview with Itsu Hiraki, director of the National Space Development Agency, by Koichi Shiraishi, assistant manager of NIKKEI BUSINESS; date and place not given]

[Text] [Question] In the 1960's, Japan began development of the H-1 rocket launch program on its own. In what form did development progress before the H-1 rocket?

[Answer] Even in wartime, rocket research was carried out, but the space age curtain opened for Japan in 1955 with the launch test of the Pencil rocket. This was performed by the Tokyo University Institute of Industrial Science, but research was taken over by the Tokyo University Spaceship Research Institute, which was established soon after.

Meanwhile, the Science and Technology Agency's National Space Development Center was performing launch tests at Nijima (Izu, Shichishima), but there was a residents' opposition movement and the launch center was transferred to Tanegashima. The center was reshuffled in 1969 and became the "Space Development Project Group," and the National University people performed general research there.

Eventually, centered on the two structures, the Space Development Project Group and the Spaceship Research Institute, Japanese rocket experiments progressed.

Successful Beginning of Stationary Satellites With N-1 Type

[Question] It is said that Japan had launched rockets up to then. What were those?

[Answer] At the Spaceship Research Institute, after the Pencil rockets, they were enlarged as the Kappa, Lambda, Mu series, but at the National Space Development Center, the idea of this line was further advanced, and as regards the present N rockets, the "N project" was set up to provide utility satellites. However, as rapid production of utility satellites was difficult, it was converted to the "Q Project" when it was on the brink of launching utility [satellites]. At that time, ionosphere observation satellites of 85 kg, which were the extent of the launch ability, were being tracked.

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However, user needs steadily escalated in the direction of enlarging the satellites, and this degree could not possibly be reached. Hence the Q Project was stopped halfway, and a new N Project began.

[Question] To what extent did U.S. technology enter into the N Project?

[Answer] In the United States, rockets of the possible extent of the N Project are called "Delta." These are converted as first-stage rockets of the intermediate-range missile "Thor," with the second and third stages being added. Up to the present time, 153 Delta rockets have been launched at NASA alone; this was introduced to Japan because it was considered suitable. The first and third stages have been almost completely retained; the second stage is an improved, developed version of the second stage of the Japanese Q Project.

For its performance, at first the power to lift a 100 kg satellite into stationary orbit was pursued. As the Q project had the power to lift an 85 kg satellite into a low-level orbit, when this was changed to a stationary orbit there was not the launch power for 20 kg, and we were talking of a great advance.

The outcome of this was entirely that the so-called "kick" of the N-1 stage was successful in launching the satellite; this was followed by the "second kick." In February 1977 the "second kick" was launched, becoming the first Japanese stationary satellite. Finally the N-I type rocket reached a stationary satellite launch power of 130 kg.

European "Aryan" Cheap; Opposition to America

[Question] However, one could say the situation was that this degree of launch power did not meet the users' needs, couldn't one? From the users' side, what actual weight of satellite do they say they want to launch?

[Answer] Satellite capability advances, and weight is also advanced, but for example in the "Sunflower" weather satellite, because the precision camera (a visible infrared scanning radiometer) and so on pile up weight, it has reached 350 kg. Because this is unreasonable for an N rocket, a launch in the United States was arranged. Launches in the United States were also arranged for communications and broadcast satellites, known as "Sakura" and "Yuri."

"Sunflower" was launched in July 1977, with an assumed lifetime of 3 years. In fact, this lifetime has been exceeded. Next, it is essential to improve the N-I so that Japan will have the power to launch its "No 2 Stationary Satellite." Concerning the method of this improvement, it has been argued both that "it would be a good thing to introduce the improved type of U.S. Delta rocket as it is," and that "the United States would not export the latest technology to other countries." As this is indecisive, the outcome was that a "black box" form of hardware, the contents not being disclosed, was imported from the United States.

As a result, a launch capability test is to be performed with the N-II in February, and if this is a success, a program for launching the "No 2 stationary satellite" will be advanced.



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[Question] In the N-II type, what proportion of independent, Japanese technology is there, as you mentioned, and what proportion is contained in the black box?

[Answer] The term "domestically produced" is used in various ways and is difficult to define, but we are thinking of a large amount of money. This has increased from the introduction of the N-I type to the N-II type. I would say that in the former, about 60 percent was imported.

[Question] That means more than half is U.S. technology, doesn't it? In the European Space Agency (ESA) there is the "Aryan" rocket. How do its capabilities compare with the N-II?

[Answer] Let us briefly touch on the present state of world rocket technology. First, in the United States the technology has been established, beginning with applications of missile technology, for launching the huge Saturn 5 and other rockets utilized in the Apollo project, or the Titan, Atlas, Centaur, and other types that launched the Voyager, Pioneer, and other planetary probe craft.

As for Europe, in England there was the so-called Black Arrow satellite launch project, which failed and was discontinued. In the European Community, attempts were made by the European rocket development organization ELDO to launch satellites. After this, the European Space Research Organization (ESRO) and ELDO were merged to form the present ESA, and the Aryan being developed there can in fact rival the United States.

Like Japan, Europe has recourse to the United States for satellite launches, but the aim seems to be to rival the United States by cheap launches with the Aryan. As the launch capability created is 925 kg, nearly three times that of the N-II, in the future the aim may be to launch two satellites in tandem simultaneously with the same launcher.

Independent Technology: "Liquid Hydrogen"; "Inertial Guidance"

[Question] Well, the H-1 rocket is a genuine development from this; it is capable of launching a 550 kg stationary satellite, isn't it? With the increase in capacity over the N-II, the name of the program itself was changed. What was the reason for the original alteration?

[Answer] Mainly because, as you said, the N projects depended to quite an extent on U.S. technology, there of course existed various restrictions. Even for the H-1, an independent technology was developed and introduced, and it was thus not necessary to buy U.S. parts. However, with the continuation of the N project in this way, restrictions due to imported technology will probably drag on into the distant future. So changing over to the H project means strengthening independent kinds of development.

With regard to practical development methods for the H-1, various arguments have been raised; initially the opinion was even that it should be completely redeveloped from the first-stage rocket. However, utilization of the results up to that point meant using as the first stage a single N-II first stage just about as it was, and development of completely new technology, using liquid

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hydrogen as fuel, for the second stage. A high-power, newly developed third stage is intended.

[Question] Liquid hydrogen is to be used as the second-stage fuel. How does it compare with fuels up to now?

[Answer] Hitherto, the fuel used in the second stage has been a hydrazine system, but as this is toxic it is extremely dangerous. As against this, hydrogen, as I am sure you will agree, is of interest to many people as a clean energy source of the future. It has the further advantage that the specific thrust (thrust per unit weight) is high. But hydrogen is highly explosive; liquid hydrogen has to be used, and cryogenic temperatures, below  $-200^{\circ}\text{C}$ , are necessary for this.

The United States has not released this cryogenic technology, but recently the climate has changed and now it is all right to sell it. However, a policy that liquid hydrogen engines be produced by independent technology has been explicitly proposed in the Space Development Committee. We too have reached the stage of having confidence that it is good.

[Question] Other technology envisaged for the H-1 rocket is guidance control, isn't it?

[Answer] Guidance and control are to make the satellite follow a given course to the target. For the first "Ohsumi" satellites launched in Japan by the Spaceship Research Institute, Lambda 4S, etc., there was practically no guidance. However, in order to launch satellites for practical use, because greater precision is necessary, radio-controlled guidance in the N-I and inertial guidance in the N-II were introduced in the form of black boxes from the United States. Inertial guidance is the detection of attitude and acceleration in three directions with gyros (compasses) and accelerometers as sensors, the calculation of position by the rocket itself, and the performance of position corrections. This is being used in the H-1 as independently developed technology.

Overtaking America and Europe, and Even Leading the World

[Question] What is the actual situation with regard to launching the H-1?

[Answer] At the present time it is planned to launch a test second stage in January or February 1986 and a third stage in 1988.

[Question] The U.S. space shuttle and the European Aryan somewhat exceed Japan's H-1 in capacity, and yet the H-1 is scheduled to take the lead when put to practical use a number of years from now, isn't it? This being so, what is the sense of Japan's still carrying out individual development?

[Answer] Can there be said to be much sense in Europe's similarly not having recourse to the United States but having the "independence" of launching satellites, according to its requirements, by its own means? In this respect, the space shuttle has reliably more than four times the launch capability of the H-1, and the comparison is largely unfavorable; looking at predicted satellite

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needs, however, the launch capacity of the H-1 in Japan will be of sufficient practical worth.

For 1990-1995, it is thought that stationary satellites of 800 kg will be required. Improvements in the H-1 will meet these needs.

Further, by developing the H-1, the difference from the much-delayed space technology in the United States and Europe can be shortened somewhat.

[Question] H-1 rocket technology centers on the liquid hydrogen engine and inertial guidance equipment, but it could be something that has uses in other fields, couldn't it?

[Answer] Liquid hydrogen is closely related to the wide utilization of liquid hydrogen energy in automobiles and aircraft; the control technology permeates all electrical machinery. From the raw material aspect, too, something new is being contributed. Furthermore, we think that software for calculation methods, etc., will produce further advances in computer-assisted design (CAD).

Even though Japan's space technology appears promising, it will surely raise the fears of the United States and the West. But there are sufficient grounds for thinking that, like automobiles and electronics do at present, it can lead the world.

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SCIENCE AND TECHNOLOGY

EAST GERMANY TO IMPORT INDUSTRIAL ROBOTS FROM JAPAN

Tokyo NIKKAN KOGYO SHIMBUN in Japanese 20 May 81 p 1

[Article: "45,000 Robots in the Next 4 Years, East Germany To Introduce Industrial Robots, Perhaps Mostly From Japan"]

[Text] Jost Prescher, president of the GDR's WMW (Machine Tool) Export-Import Corp, who is currently visiting Japan to promote economic cooperation between East Germany and Japan, held a press conference on the 19th at the Hotel New Otani in Akasaka, Tokyo. At the conference, President Prescher stated that the GDR plans to introduce 45,000 robots into their factories by 1985 in order to solve the labor shortage. The GDR has just begun to develop robots, and the volume of production is thought to be very low. Therefore, there is the possibility that the GDR will import most of the planned 45,000 robots from Japan and other foreign countries. Industrial robots that the GDR intends to introduce into their factories include work feeder machine (10-12 percent), pressing work feeder (18-20 percent), and other machines, such as painting robots, replacements for manipulators for forging, and deflashing tools for casting.

President Prescher has come to Japan in order to promote the trade of machine tools between the two countries. He explained the current situation in the GDR's machine tool industry and future trends in its technological development. He also explained the GDR's export plan for Japan.

The GDR's machine tool industry consists of four combines (industrial complex) which belong to the Machine Tool Export-Import Corp.

The GDR started trading with Japan more than 20 years ago and has established a firm status among Japan's bearing makers and tractor manufacturers. The GDR plans to capture 4-5 percent of the Japanese import market for machine tools in the future. Japan has mainly exported to the GDR specialized machine tools such as joint connecting tools.

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SCIENCE AND TECHNOLOGY

LASER-SENSING MACHINE TO INSTRUCT ROBOT IN JOB ENVIRONMENT DEVELOPED

Tokyo JAPAN ECONOMIC JOURNAL in English Vol 19, No 956, 26 May 81 p 9

[Text]

A robot-instructing machine to teach versatile robots to perform complex jobs like a human worker by understanding in what form, shape and condition each work object comes in and what are its surroundings, including the whereabouts of necessary tools, has been developed by a Japanese governmental laboratory, it was recently learned.

The new achievement made and disclosed by the Electro-technical Laboratory of the Agency of Industrial Science and Technology, Ministry of International Trade & Industry, could provide a valuable clue to more sophisticated and complex factory robotization increasingly demanded in Japan and elsewhere.

Most such robots so far developed and practically applied are capable of performing repeated simple jobs like those along a given production line. Some similar robot-teaching machines have been developed

in America, but they have the drawback of requiring the use of complex computer programming and computer languages and thus pose problems of taking much time to operate and risking errors.

The new device learns about any object to work on and its surroundings in a matter of a few minutes and transmits all information to robots, even remotely.

According to the laboratory, its "Environment Teaching System" includes a laser pointer, a TV camera, a display device, a keyboard and an information processor.

A human operator first observes any object of work and all surrounding conditions through a monitoring TV camera and screen and feeds all his findings into the system through the keyboard. Previously, the system is made to remember all basic and standard work object shapes

and positions (in coordinates of lines drawn from various points of the objects). The system roughly understands its findings by comparison with its memory.

The system then "feels" the object of work by its laser pointer beam hitting a single point of the object with a small bright spot, accurately understanding the location of that point from the beam's directional angle and other factors. Hitting with several different spots by the beam will allow the system to ascertain the object's configuration, position, and size by the aid of its memory. All surrounding conditions may be grasped by the system through its laser beams. A very complex object is conceived by putting together divided images. Finally, all that the system has understood is corrected by the operator by his display screen checks.

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SCIENCE AND TECHNOLOGY

FULL-SIZE STEEL FRAME MODELS TO BE USED FOR EARTHQUAKE TESTING

Tokyo JAPAN ECONOMIC JOURNAL in English Vol 19, No 956, 26 May 81 p 9

[Text]

The series of experiments on the resistance of ferro-concrete buildings to earthquakes, jointly sponsored by the Japanese and U.S. Governments, will move on to its second round of using a full-size steel frame model from this year.

This new round also will be for a three year-period as the first, which began from the summer of 1979 and will end this summer.

Such research may have already attained quite a high level in both countries and elsewhere. But there are some basic problems, including just how a building will be deformed by the force of earthquakes, especially in the case of buildings in real daily use, which are yet to be clearly answered.

The experimental studies are jointly sponsored and managed by Japan's Ministry of Construction and Science and Technology Agency and America's National Science Foundation and National Bureau of

Standards. In addition to experts from the sponsors, many others from governmental and academic research institutions from both countries, and various Japanese construction and steel companies have participated and will continue to do so.

The studies, conducted at the Ministry of Construction's Building Research Institute in Tokyo, have so far involved a seven-story indoor ferro-concrete building, a concrete structure sinewed by many slender steel rods.

The follow-up three-year second round to start in August when the original Japan-U.S. agreement concerned expires will involve a five to seven-story indoor steel-framed building covered by concrete.

The original two-year agreement will be extended three years by a new agreement to be signed on May 18. The second round will cost some ¥500 million.

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SCIENCE AND TECHNOLOGY

LEGALITY OF CARTEL FOR MACHINE TOOL UPHELD BY W. GERMANY

Tokyo JAPAN ECONOMIC JOURNAL in English Vol 19, No 956, 26 May 81 p 6

[Text]

Japanese machine tool builders' export cartel can be legally acknowledged, West Germany's Federal Cartel Agency told the Japanese Government recently.

Government sources quoted the German agency as saying that the Japanese cartel setting floor prices for machine tool sales in Europe does not run counter to the anti-trust law of that country.

The German agency judged it lawful after its two and a half months' probe of related data presented by the Japanese Government.

Behind the favorable judgment of the German trust-busters is the administrative guidance of the Japanese Government on the action of "outsider" makers in export transactions. The government has ordered non-cartel member makers to abide by the floor export pricing system set by

the cartel.

The cartel, formed by some 30 major machine tool builders last January on the basis of the Export and Import Transaction Law, is aimed at moderating exports to Europe in connection with the EC's recently created system of watching the inflow from Japan of machine tools equipped with numerical control devices, machining centers and some other products.

Along with the floor pricing system formed by the cartel members, the government added the restrictions on "outsiders" to the effect mentioned above so that exports may be curbed effectively.

The floor pricing system is applied to shipments to 15 European countries — 10 EC members, Austria, Norway, Spain, Sweden and Switzerland.

It will be enforced for one year until this December.

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SCIENCE AND TECHNOLOGY

GOVERNMENT, SEMICONDUCTOR INDUSTRY WORK TOGETHER

Tokyo JAPAN ECONOMIC JOURNAL in English Vol 19, No 956, 26 May 81 p 7

[Text]

The Japanese Government and semiconductor industry are now working closely to prevent the long-smoldering Japan-U.S. semiconductor trade issue from rekindling and developing into a "war."

They seem to have learned a lesson from the recent negotiations between the Japanese and U.S. Governments on their bilateral automobile trade issue, which ended with Japan's concession — voluntary export restraint by Japanese automakers.

#### Tariff cut

At the May 7-8 summit talks in Washington, Prime Minister Zenko Suzuki informed U.S. President Ronald Reagan of Japan's readiness to harmonize import tariffs on integrated circuits from the present 10.1 per cent for Japan and 5.6 per cent for the U.S. to 4.2 per cent, effective next fiscal year.

This notification complies with the U.S. Administration's strong request to enforce far in advance the agreement at the Tokyo Round of multilateral trade negotiations that both nations would lower their IC duties to the same rate of 4.2 per cent by 1987.

Such a one-sided concession of the Government in trade talks so far have invited a strong resistance

from the industry concerned. This time, however, it was not so.

The Electronic Industries Association of Japan immediately announced in the name of President Sadakazu Shindo (who concurrently is chairman of Mitsubishi Electric Corp.) that his association would not raise any particular objection to the Government's decision as it understands that Japanese and American semiconductor makers should compete on an equal footing. The 587-member associations thus has virtually accepted the Government's step.

#### Calm reaction

Executives of major Japanese semiconductor manufacturers generally made generous comments. Vice President Atsuyoshi Ouchi of Nippon Electric Co. (NEC), Japan's largest semiconductor maker, said that although the adverse impact of the IC tariff lowering on his company should not be underestimated, NEC would not make a particular complaint to the Government.

Against the background of the industry's rather calm reaction to the Government's decision is that Japanese semiconductor makers are ahead of their American counterparts in techniques to mass produce 64-kilobit

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dynamic random access memory (RAM) chips and other very large-scale integrated circuits (VLSIs), which are considered to be "strategic next-generation products."

Another factor that keeps them calm is that they fear any careless reaction might stimulate American sentiment against rising imports from Japan and, if worse comes to the worst, lead them to start a campaign to "boycott made-in-Japan products" in the world's largest IC market.

After learning many lessons from the 1977-79 "semiconductor war" between Japan and the U.S., NEC, Hitachi, Ltd., Toshiba Corp. and Fujitsu Limited have located their semiconductor manufacturing plants in the U.S. Mitsubishi Electric and other medium-scale IC makers are going to follow suit.

Moreover, NEC recently doubled the 16K dynamic RAM production capacity of its plant in Mountain View, Calif. to 600,000 chips monthly. It is going to build a second plant to meet mounting demand from local customers.

The forerunning Japanese companies are now trying hard to strengthen their marketing capabilities and raise the share of made-in-USA Japanese-brand products in the American semi-

conductor market.

#### Bilateral IC trade

Simultaneously, NEC and Fujitsu have been discontinuing shipments of 16K RAMs from Japan to the U.S. spot market to cope with the ever deteriorating spot quotations.

As a result, the bilateral IC trade, which was some ¥2.8 billion in favor of Japan in calendar 1980, has been running against it since the beginning of this year. According to EIAJ, Japan's IC exports to the U.S. during the first quarter of this year dropped 27.3 per cent from the same period of last year to ¥13,948 million. During the same period, Japan's imports of American-made ICs reached about ¥16.3 billion, or around ¥2 billion larger than exports. If fiscal or around ¥2 billion larger than exports. If fiscal year 1980 (April, 1980-March, 1981) is taken as a yardstick, the bilateral IC trade was ¥985 million in disfavor of Japan, an EIAJ spokesman said.

Even with these efforts, the American semiconductor industry seems to still feel uneasy about the strength of its Japanese counterpart which already has grown into a "¥1-trillion a year" industry. Optimism is unwarranted under this situation, some industry men say.

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SCIENCE AND TECHNOLOGY

MITI DRAFTS INTERIM PETROLEUM POLICY REPORT FOR 1980'S

Tokyo JAPAN ECONOMIC JOURNAL in English Vol 19, No 956, 26 May 81 p 4

[Text]

Cracking residual oil will be the petroleum policy of the Ministry of International Trade & Ministry in the 1980s.

The outlook is contained in an interim report prepared by an ad hoc committee composed of MITI's Agency of Natural Resources and Energy and the Ministry's key bureaus.

The MITI group envisaged that the Government should subsidize the oil industry's attempts to crack residual oil. Equally significant, it advocated that ANRE ease its control over product oils' prices so that refiners can raise prices for light product oils more easily. In addition, the committee said that oil companies should be encouraged to tie up among themselves to improve their financial positions.

The basic oil problem is seen as the increasing demand for lighter products, such as gasoline and kerosene. But the light crude oils' supplies will decline. The report thus said: "There is no guarantee that the demand

situation will smoothly fit the supply situation" in the 1980s.

As the group anticipated, light products, e.g., kerosene and diesel fuel, will grow short. By comparison, heavier products will tend to be oversupplied. A basic solution to the anticipated problems is converting the heavy residual oils into light products, the group concluded.

The committee expressed concern about the oil companies and their "physiques."

In light of the foreseen lack of oil industry growth, the report said that refiners should cooperate in such fields as procurement of crude oil and development of new refining technology and alternative energy sources. The tieups should be encouraged, regardless of oil companies' nationality, the report said.

Creation of powerful Japanese oil companies comparable to the present international giants was ruled out as virtually impossible and unnecessary.

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SCIENCE AND TECHNOLOGY

KYUSHU ELECTRIC TO OPERATE FIRST OTEC TYPE POWER PLANT

Tokyo JAPAN ECONOMIC JOURNAL in English Vol 19, No 956, 26 May 81 p 9

[Text]

Japan's first trial power plant deriving energy from the temperature difference between the surface and depth of the ocean is expected to be put into operation sometime from this year to next by Kyushu Electric Power Co.

Such studies on OTEC (ocean thermal energy conversion) have been conducted in various places in the world; in Japan, notably by Saga University, in northern Kyushu.

According to Kyushu Electric Power's head office at Fukuoka near Saga, it is now planning to build Japan's first test power plant with an output of 50 kilowatts within its oil-burning Shin Tokunoshima power station on Tokunoshima Island. It hopes to start construction early this autumn and complete it by August, 1982.

The island is in the Amami Oshima island chain between southern Kyushu and Okinawa. The prospective power plant will utilize the mother station's cooling water discharge to keep the local surface seawater it takes in at a high temperature and maintain the temperature difference between the surface and depth at around 30 degrees C. throughout the year.

The plant will have an about 4-kilometer long deep water intake pipeline stretching 500 meters down the local sea surface to obtain much colder water at that depth.

The plant will work accord-

ing to the well-known principle of gasification of either liquid ammonium or liquid fluorocarbon with the warmed-up surface seawater. The force of gasification turns the power generating turbine, and the spent gas is converted into the original liquid state by the deep seawater of 10 degrees C. or even colder.

The test plant will cost a rather moderate ¥700 million or ¥800 million to build because the principal hardware already is on lease to Saga University, which cooperating with the company, has already succeeded on a smaller experimental scale in generating 700 watts of power with a 50-meter-long deep water intake pipeline at Imari City, Saga Pref.

The company envisions ultimate development of a much larger power plant of several thousand kilowatts in output for application to many remote islands if the test plant works well. Problems yet to be solved include such plant's resistance to stormy waves, behaviors of oxygen and other gases coming up from the deep, and proper local maintenance of ammonium, fluorocarbon and other media.

The company's plan has been motivated by the fact that it has to service 37 communities on 30 remote islands with 170 oil-burning power stations at double the cost of its services in Kyushu Proper.

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SCIENCE AND TECHNOLOGY

LIVECON DEVELOPS METHOD TO PRODUCE STRONGER CONCRETE

Tokyo JAPAN ECONOMIC JOURNAL in English Vol 19, No 956, 26 May 81 p 9

[Text]

A new method of producing concrete that is at least 30 per cent stronger than that produced by conventional methods has been developed by Livecon Engineering Co., Ltd. of Tokyo. The eight-year-old concrete engineering firm said the concrete was 120 to 220 per cent more resistant to repeated shocks, such as earthquake.

According to the company, its Sand Enveloped with Cement (S.E.C.) System promises much better "compressive strength" or capacity to withstand external stress as well as "bending strength" or the capacity to resist repeated jolts and other earthquake shocks without any increase in the necessary amount of cement. The S.E.C. System has also been applied to production of innovational types of mortar, ready-mixed concrete, and "shotcrete" (a special soft concrete pressure-blown into cracks, holes and gaps).

The company's already commercialized achievement has drawn wide attention among Japanese civil engineering and construction experts because Japan's newly-revised Construction Standard Law sets a far higher official standard for earthquake resistance than heretofore. All future buildings will be subject to the new law from June.

As the company explained, sand particles to be mixed with cement and aggregates (stones, pebbles and other hard

mixtures in concrete) are made uniform in humidity by a vacuum process of removing the air around such particles.

When the processed sand particles are blended with cement, each grain of sand and cement powder will make a "shell formation," the hard core of the new kind of concrete.

This processing does away with problems common in conventional concrete producing methods such as bleeding — water leakage — and settling of aggregates. All shell formations unite with aggregates to prevent such settlement. They also assure strong attachment of concrete to steel and other structures.

The remarkable earthquake resistance of the new method has been confirmed by Masanori Tsuji, an expert in such engineering at the Tokyo College of Science, and by a series of relentless tests. A scale-model rectangular column of concrete made by the best conventional method broke down after being hit 38 times in succession by a falling steel ball, but equivalent columns made by the S.E.C. System fell only after being struck 89 to 125 times.

Lecturer Tsuji has evaluated the new method for minimizing concentration of water or air beneath aggregates or internal steel rods where stress gathers and concrete destruction starts.

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SCIENCE AND TECHNOLOGY

BRIEFS

INDUSTRIAL ROBOTS EXPORT--Hitachi, Ltd. a major electrical machinery builder, is expected to shortly sign an agreement with Britain's Lansing Ltd. to sell industrial robots in Britain. Under the marketing tie-up arrangement, the Tokyo company will supply the British forklift-truck maker with scores of arc welding and other general-purpose robots a year. Hitachi is eager to sell more robots in the U.S. and Europe. The company late last year provided America's Automatix, Inc. with a license to produce industrial robots. While exporting 30 robots to Europe last year, Hitachi plants [as published] to step it up this year to some 200 units. The company envisions creating new robot sales footholds in West Germany, France and three Scandinavian countries in the future in addition to Britain. [Text] [Tokyo JAPAN ECONOMIC JOURNAL in English Vol 19, No 956, 26 May 81 p 6]

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