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Japan Report

(FOUO 32/82)



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JAPAN REPORT

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POLITICS

MANEUVERS AMONG LDP FACTIONS REPORTED

Tokyo SANKEI SHIMBUN in Japanese 22 Apr p 2

[Article by Reporter Shizuo Kobayashi: "Tanaka Faction's Countermeasure Against Three Anti-Suzuki Factions."]

[Text] With the party presidential election this fall as the backdrop, and with the budget deficit problem and the first court ruling on a politician defendant in the Lockheed incident, the movement of factional opinions within the Liberal Democratic Party (LDP) have begun to appear. Both the Fukuda and Nakagawa factions, estimating the future political situation, have already decided to hold their factional in-service training conferences, and on the 21st the Kawamoto faction also announced it will have its factional in-service training conference in September. And in opposition to the attitude of these three factions of trying to upset the Suzuki and Tanaka factions, the Tanaka faction also set up a governing board meeting and meetings for the mainstay party members and younger members, and will begin tightening up the bonds of unity in preparation for the future political situation. With the end of the Diet near at hand, there is the smell of blood in the movements of these various factions.

At its regular general meeting on the 21st, the Tanaka faction's "Nanoka-kai," created by Diet members elected less than five times to the House of Representatives, decided to hold a conference right after the consecutive holidays (Golden Week holidays) and invite former Prime Minister Tanaka. With regard to this, this group's leaders are emphasizing that this has nothing to do with the movement of the political situation, saying: "this is a regular 'drinking party' since the end of the Diet session is near."

However, the Tanaka faction set up in turn a meeting for those elected to the House of Representatives six to eight times on the 22nd, and a meeting for those with cabinet experience on the 27th. Former Prime Minister Tanaka is expected to attend all of these meetings. It seems this series of meetings is for strengthening their unity in preparation for the future political situation.

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This kind of maneuvering by the Tanaka faction is not unrelated to the fact that both the Fukuda and Nakagawa factions quickly announced their factional training conferences at the beginning of this month. The Fukuda faction's conference will be held at a hotel in Hakone on both the 19th and 20th of June; and the Nakagawa faction is undecided on the dates and location but intends to hold it after the Fukuda faction's training conference. These two factions are intensifying their confrontation with both the Suzuki and Tanaka factions over Prime Minister Suzuki's reelection. And although in the beginning the Tanaka faction officials showed composure with the comment, "our unity is always firm; it isn't particularly necessary for us to hold an in-service training conference," it seems they decided to hold separate meetings for officials and younger members after making the judgment that "now is the time to tighten up the faction."

Likewise, the Kawamoto faction, keeping its eye on the November presidential election, will hold its training conference at Hakone for three days, the 4th through the 6th of September; and furthermore, "it will work out across the board policies on the economy, foreign affairs and defense at its national conference for the formation of a new 'policy research committee' expected on 28 September. This will be the "Kawamoto government plan" when Economic Planning Agency Minister Kawamoto runs in the presidential election.

The future political situation looks like a schema for confrontation between the three factions of the Suzuki and Tanaka factions, which aim at Suzuki's reelection, and the Nakasone faction, which wants the support of these two factions "post-Suzuki," and the Fukuda, Kawamoto and Nakagawa factions. In this schema, the Tanaka faction, the "father of Suzuki," has started moving since these three factions have intensified their "anti-Suzuki attitude."

It seems that the three "anti-Suzuki" factions will commence firing criticism at Suzuki on the budget deficit question, but since Prime Minister Suzuki and the Tanaka faction assume the attitude that "no matter who is in charge of the government, there are no miraculous plans; this problem must be resolved with the government and party united," it is difficult for the three "anti-Suzuki" factions to attack. In particular, it is difficult for Kawamoto to act inasmuch as he occupied the position of the "person responsible for the management of the economy" in the Suzuki cabinet as Minister of the Economic Planning Agency for nearly two years. This is why Kawamoto earlier gave warning to the managers of his faction to be careful in their speech and behavior.

Former Prime Minister Fukuda is carefully trying to grasp the change in the political situation. "Now he is steadfastly watching the course of events." (Fukuda faction official) And Kawamoto himself, like former Prime Minister Fukuda, is taking a "natural" pose.

The Fukuda faction officials state: "The two points are the budget deficit problem and political ethics. Former Prime Minister Fukuda is steadfastly watching the court ruling on Takayuki Sato and Tomisaburo Hashimoto on 8 June." The Fukuda faction's tactics are to shake up the Suzuki government

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by bringing to the forefront the question of establishing political ethics which can more easily be "material for attack" than can the budget deficit issue. Regarding this, the Tanaka faction officials are showing they will stand up and take it, saying "when Fukuda attacks, his old trick is to talk about the establishment of political ethics."

It seems inevitable that former Prime Minister Fukuda will work out "the establishment of political ethics" at his faction's training conference on 19 June. The view that Fukuda's words will be the trigger for political upheaval is increasing within the LDP.

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POLITICAL AND SOCIOLOGICAL

KOMOTO AS A CONTENDER TO PREMIERSHIP DISCUSSED

Tokyo MAINICHI DAILY NEWS in English 24 Apr 82 p 2

[Article by Taro Maki: "Komoto in Political Limelight"]

[Text]

To all appearances, problems serious enough to rock the administration of Prime Minister Zenko Suzuki are likely to emerge en masse after the holiday-studded Golden Week from late April to early May. Intensification of trade frictions with the United States and Western Europe, the Versailles summit conference scheduled for June 4-5, and the disclosure of a shortfall in excess of 2 trillion yen in tax revenues for the central government — all these and other elements point to the possibility of a "great turmoil" forecast by former Prime Minister Takeo Fukuda.

In these circumstances Toshio Komoto, director general of the Economic Planning Agency, is the politician who is attracting most attention. He is attracting attention not only because he is, together with Director General Yasuhiro Nakasone of the Administrative Management Agency, a leading contender for the post of prime minister, but also because he is known as a perennial advocator of positive management of the Japanese economy.

How this unique businessman-turned politician will move may determine the political scene in the second half of this year.

Once before, Komoto was the center of political attention. In the fall of 1977, he was chairman of the Policy Affairs Research Council of the ruling Liberal-Democratic Party when Fukuda was prime minister.

It was a time when, after the initial shock of the first oil crisis, the Japanese economy was expected to regain its vitality, but it remained stagnant for a long time. While domestic demand remained weak, Japanese enterprises were promoting exports, thus inviting severe complaints from the United States and Western Europe.

Prime Minister Fukuda, however, was insisting on "restraints" in fiscal spending. He was unwilling to change his economic policy in the direction of expansion with the help of increased budgetary allocations.

It was Komoto who challenged Fukuda. "The

national economy has been dormant for a long time and the number of the unemployed is 1.1 million. If this situation remains, Japan is bound to experience the social unrest now observed in other countries. The biggest political task today is to take a bold step to overcome the recession," argued Komoto.

As the nation's business circles had been discouraged by Fukuda who, fearful of a resurgence of inflationary pressures, was hesitant to resort to expansionary measures, Komoto acquired a good reputation as "a politician with a sense of actual business management."

Finally, the government followed his lead and compiled a supplementary budget incorporating a 2-trillion-yen investment in public works projects.

Political Turmoil

If Komoto again demands a switch to an expansionary policy today when a huge tax shortfall has become certain, he is bound to create a great political commotion.

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He was born in Hyogo Prefecture on June 22, 1911, the same year as Prime Minister Suzuki and U.S. President Ronald Reagan. Among his rivals, Susumu Nikaido, secretary general of the Liberal-Democratic Party, is two years his senior and Nakasone seven years his junior.

Komoto's family is said to date back to before the Edo Period. His father was once a school principal and a village headman.

At middle school, he was good at mathematics and won the reputation of being the brightest boy since the school's inception.

In 1928, he advanced to a higher school in Himeji, also in Hyogo Prefecture. It was there that he had one of the most dramatic experiences in his life. When he was a second-year student, a school military drill was to be held at the Himeji Infantry Regiment parade ground. Before his fellow students, the young Komoto delivered a speech opposing the drill. "What is most important for students is to study. Military training is meaningless," he declared.

His speech angered the military that dominated the country at that time and Komoto was expelled.

A student who might have advanced to the Tokyo Imperial University (present-day Todai), he went to Osaka and worked as a factory hand and stevedore.

After graduating from Nihon University in Tokyo, he joined a shipping firm operated by his brother-in-law as an executive.

The company only had two freighters, but 30 years later, it had grown to become the third biggest shipping firm in Japan, next only to Nippon Yusen Kaisha (NYK) and Osaka Shosen Kaisha (OSK). The growth of Sanko Steamship Co. in such a short period eloquently demonstrates Komoto's management skill.

Throughout his period as manager in the shipping industry, he remained positive in adopting various measures. Even after entering the political world, his stance toward positive economic policies never wavered.

Some of the nation's top business leaders still seem skeptical of his economic policies, but such leaders as Chairman Kazuo Iwata of Toshiba Corporation and President Eishiro Saito of Nippon Steel Corporation have begun expressing their support of Komoto after having often examined his economic thinking over meals. It may be possible to say that he is gradually gaining a foothold in business circles.

Miki Faction

If advocacy of economy-stimulating policies is one weapon for Komoto's challenge to become the next prime minister, his remaining task must be how to increase his supporters within the ruling party.

After serving former Prime Minister Takeo Miki as his chief financial source, Komoto succeeded Miki as leader of the Miki faction, currently with 42 members in the Diet. This number is short of the 50 needed

for anyone to file his candidacy for the party presidency — which almost automatically means the post of prime minister when the LDP enjoys a comfortable majority in the Diet.

He is in need of cooperation from other factions. At present, he is making contacts with Fukuda, who heads his own faction, under the guise of consultations on how to manage the nation's economy. Both Fukuda and Komoto are known as economic experts.

In parallel with his approach to the Fukuda faction, Komoto is also seeking contact with the biggest faction, the one headed by former prime minister Kakuei Tanaka, through Shin Kanemaru, who is one of Tanaka's closest confidants.

Komoto is also seen urging some independent Dietmen to join the LDP.

Thus, he may be in real earnest in challenging Prime Minister Suzuki in the LDP presidential election scheduled for this coming fall.

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POLITICAL AND SOCIOLOGICAL

SUZUKI CABINET'S DIFFICULTIES DISCUSSED

Tokyo MAINICHI DAILY NEWS in English 2 May 82 p 2

[Article by Takuo Hayashi in the column "Political Periscope": "Suzuki Cabinet in Distress"]

[Text]

It has now become quite clear that the fiscal 1981 budget suffered a huge "shortage of revenue." According to Finance Minister Michio Watanabe, the revenue shortage amounted to more than two trillion yen. Fiscal 1981 began in April 1980, and ended in March 1981. Since the fiscal year in question has ended already, the necessary fiscal steps to fill the deficit will be taken by the authority of the government. The government does not have to compile a supplementary budget for that purpose and obtain Diet approval. Most of the expenditures for the purpose of making up the loss has to be covered by the 1983 fiscal budget to be compiled this year.

There is little doubt that there will be a big shortage of earnings for the fiscal 1982 budget which was approved early in April. The big shortage of revenue in the fiscal 1981 budget resulted from the fact that the tax revenue was far below the original estimate due to the slowdown of the economic growth rate. It is believed almost certain that a similar

phenomenon will occur in the 1982 fiscal year beginning from April 1982 through March 1983. It is also speculated that the revenue shortage in the fiscal 1982 budget will run up to 3 trillion yen.

With regard to fiscal 1982, the government needs to compile a supplementary budget to cover the shortage and submit it to the Diet for approval. But, where is the revenue source to cover the deficit? It seems that flotation of deficit-covering national bonds is the only means available.

Floating Of Bonds

The government, in compiling the fiscal 1982 budget, cut the amount of the deficit-covering national bonds to be floated by 1,380 billion yen compared with the original 1981 budget. This was done on the basis of Prime Minister Zenko Suzuki's public pledge that "by making the flotation of the deficit-covering national bonds nil in fiscal 1984, the fiscal reconstruction must be achieved — and for that purpose the flotation of such bonds should be reduced every year."

However, even if the flotation is cut by 1,380 billion yen in the original budget, if the flotation is increased by 3 trillion yen by the supplementary budget, the total amount of the deficit-covering national bonds in fiscal 1982 will be more than that in fiscal 1981.

Supplementation of the fiscal 1982 budget, however, is not an immediate task for the government. Compilation of a supplementary budget and its submission to the Diet by the government usually takes place sometime after autumn. So, the government can take time, at least several months, with regard to the question of compiling a supplementary budget for fiscal 1982.

The immediate headache for the government is what to do with the compilation of the 1983 national budget. It is toward the end of this year that the government will make a decision at its cabinet meeting on the draft budget. But, it has to make a cabinet decision at an earlier date on the guideline with which various ministries will file a roughly estimated

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request with the Finance Ministry.

The government at a cabinet meeting on June 5 last year decided on a strict guideline calling for a "zero ceiling as a matter of principle." The 1982 budget was compiled on the basis of such a strict guideline, and yet it is expected that the spending will exceed revenue by about 3 trillion yen.

Outlook Grim

The economic forecast for fiscal 1983 is extremely grim. In case the government, in compiling the 1983 budget, cuts the deficit-covering national bonds by 2 trillion yen compared with the original 1982 budget, it is speculated that there will be a large-scale shortage of revenue, amounting to 6 or 7 trillion yen, in comparison with the necessary expenditures.

The usual "zero ceiling" guideline is therefore insufficient to balance the fiscal 1983 budget. An extremely drastic "minus ceiling" will have to be introduced. In other words, aside from a few exceptions involving defense spending, overseas aid expenses, etc., almost all expenditure items must be cut on a large scale compared with the expenditures in fiscal 1982.

But then, we must question if such is really possible. The Finance Ministry believes that "although, great efforts must be made to realize a large scale reduction of expenditures, that alone is not enough to balance the revenue and expenditures." Then, is it possible to cover the revenue by increased flotation of deficit-covering national bonds by withdrawing the public pledge of Prime Minister Suzuki calling for "reduction of the flotation of such bonds to make it ultimately nil in fiscal 1984?" That would mean the political suicide of Prime Minister Suzuki.

Ultimately there seems to be no means but a large-scale increase of indirect taxes. Since an income tax cut is inevitable for fiscal 1983, an increase in indirect taxes is believed necessary not only to make up for the loss resulting from such an income tax cut but also to ensure a large amount of tax revenues.

The government has already started to hint at such a move. Can Prime Minister Suzuki actually carry it out? There are now some signs within the Liberal-Democratic Party to hold the prime minister to task and rebel against him. The Suzuki cabinet now faces the biggest crisis since it was inaugurated.

(The writer is journalist-professor at Musashi University in Tokyo)

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POLITICAL AND SOCIOLOGICAL

FARM LOBBY OPPOSES INCREASED IMPORTS FROM U.S.

Tokyo THE DAILY YOMIURI in English 24 Apr 82 p 2

[Editorial: "The Farm Lobby"]

[Text]

Agricultural organizations and political parties are stepping up their opposition to the freeing and expansion of farm imports in the face of US demands that increased imports of farm products be included in the second market opening package to be decided at a meeting of economic affairs ministers on May 7. Meanwhile, the US has moved to discontinue talks at the Japan-US trade subcommittee and will take the farm import issue to the General Agreement on Tariffs and Trade (GATT).

The Agriculture, Forestry and Fisheries Committee of the House of Representatives Thursday adopted a resolution that proper steps should be taken to avoid sacrificing farmers and fishermen in respect to the liberalization of residual imports restrictions and expansion of import quotas.

Forward-Looking Stance

We don't object to the resolution itself. But present import curbs on farm and fishery products should not be allowed to stand. Imports of beef, oranges and juice should be tackled not only from the viewpoint of Japan's responsibility in the free world but also from the position of the people's interest. The government needs to take a forward-looking stand on expansion of import of farm and fishery products.

The planned second package should reflect such a basic attitude although there may be no time to work out specifics.

We hope Prime Minister Suzuki will not heed only the strident voices of agricultural lobbies but will reach a wise and reasonable decision as the nation's top leader.

In this respect, the open circulars issued Thursday by the Consumers Union of Japan showed an

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extreme attitude in their demands for protection of domestic agriculture. They called for complete self-sufficiency in grain—both for food and fodder—and for revision of foreign dependence on staple foods. We have to doubt whether these demands truly reflect the consumers' attitude.

Anachronistic Thinking

Such thinking is anachronistic. Japan's present production of beef, pork, chicken and eggs and consequent improvement in the people's diet was made possible only because of vast grain imports.

Incalculable funds will be needed if the grains are to be provided solely by domestic farmers. And, even if complete self-sufficiency should be attained, it will be impossible to maintain the current standard of diet.

Overprotection of domestic agriculture will only produce a minus effect.

We deplore the senseless statements of the consumers' union. Such groups should defend the interests of consumers. This is especially so in a society where the producers have too much power. We hope the government and consumers' group will tackle the agricultural import problem from this standpoint.

(April 24)

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POLITICAL AND SOCIOLOGICAL

ACTIVITIES OF LDP FACTIONS REPORTED

Tokyo MAINICHI DAILY NEWS in English 28 Apr 82 p 2

[Article by Takehiko Takahashi in the column "Nagatacho Doings": "Meetings Held Actively by LDP Factions"]

[Text]

Prime Minister Zenko Suzuki's term of office as president of the Liberal-Democratic Party will terminate in November. If the LDP decides on Suzuki's continuance as party president, it will mean that the Suzuki administration will continue for two more years.

Voices are heard within the Liberal-Democratic Party, saying, "one year for a singer, two years for a prime minister." This means that recent "singing stars" are generally made much of for about one year only and it is customary for a prime minister to bow out at the end of his two-year term.

The Eisaku Sato administration was an exceptionally lengthy one that lasted for seven years and eight months. The Tanaka, Miki, Fukuda and Ohira administrations that came after that each ended in about two years. This is how the saying, "two years for a prime minister," originated. The supposition is that the Suzuki administration will not be an exception to this rule.

Despite such voices, the view held by many is that the Suzuki administration may still continue for some time.

This is because, differing from the case of the Tanaka, Miki, Fukuda and Ohira administrations (the last named having ended with Ohira's sudden death), there seems to be no influence intent on bringing down the Suzuki administration.

The Suzuki administration was born with the support of three large factions within the LDP — the Tanaka, Fukuda and Suzuki factions. Under those circumstances, there was no way in which Yasuhiro Nakasone and Toshio Komoto could oppose the move. Both Nakasone and Komoto have become cabinet ministers supporting the Suzuki administration.

Suzuki's Reign

The circumstances have not changed. This is the basis for the strong opinion that the Suzuki administration will still continue. Nevertheless, there are voices smoldering within

the party saying, "Isn't it about time for the Suzuki administration to withdraw?"

The reasons for this are as follows:

(1) As the boss of a faction, Suzuki became the prime minister without any effort. The earlier-mentioned four — Tanaka, Miki, Fukuda and Ohira — took care of their followers over a long period of time and spent a great deal of money. Even then, their respective administrations ended after two years. Prime Minister Suzuki became the prime minister without spending money, so two years should be sufficient.

(2) The biggest reasons for the aggravation of relations with the United States are the prime minister's statements and actions since the Japanese-American summit of May last year. In order to improve Japanese-American relations, it is necessary for Prime Minister Suzuki to step down from his post.

(3) Prime Minister Suzuki has made a political pledge to "rehabilitate public finances without a tax increase." For the

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Japanese economy from now on, it is necessary to do the Economic Seven-Year Plan over again and to carry out a drastic conversion of economic policies. Since a wrong start was made, it is up to a new administration to revise this.

Although such voices are smoldering within the party, when the question of the party presidential election in November comes up, even those criticizing the Suzuki administration possess no strategy. The only thing visible is that meetings of various factions (called study meetings) are being actively held.

The Nakasone faction held a large meeting on April 16. The Fukuda faction held a two-day study meeting at Hakone on June 19 and 20. The Komoto faction will hold a study meeting from Sept. 4 to 6 at Hakone and this will become that faction's national conference to form "a study meeting for new policies." The Nakagawa faction is also planning to hold a study meeting.

In the midst of these activities by the various factions, the Suzuki faction is adopting a prudent attitude so as not to excite the other factions.

The Tanaka faction, which holds the key to the life or death of the Suzuki administration has also begun to move. A meeting of this faction's "Nanoka Kai" consisting of its Diet members elected less than five times will be meeting in May. A meeting of the faction's members who have been elected to the Diet from six to eight times, and a meeting of those with experience as cabinet ministers will be held in succession. It is said that former Prime Minister Kakuei Tanaka will attend the last-named meeting.

When politicians gather, a crystallization of energy occurs and there are often cases of an unexpected political move becoming initiated.

If the various factions are to hold their meetings while Prime Minister Suzuki is traveling abroad, this must be a matter of concern for Suzuki.

Looking toward November when the party president's term of office will expire, the atmosphere within the LDP is likely to become disturbed.

(The writer is an adviser to the Mainichi Newspapers and former chief editorial writer).

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POLITICAL AND SOCIOLOGICAL

LDP'S IDEA OF THINK TANK EXAMINED

Tokyo THE DAILY YOMIURI in English 30 Apr 82 p 3

[Article by Kenji Kitahara in the column "Political Beat": "LDP's Think Tank"]

[Text]

It may seem odd but the ruling Liberal-Democratic Party (LDP) appears to want to establish a "Soviet-type" government-party regime.

The thought strikes our mind when we hear the words and watch the behavior of LDP Secretary-General Susumu Nakaido and LDP Policy Board Chairman Rokusuke Tanaka, although what they are doing has been mainly motivated by their rivalry with Chief Cabinet Secretary Kii-chi Miyazawa.

Nakaido and Tanaka, who control the core of the party, now are anxious to create a "think tank" as a party policymaking organ. It would include retired bureaucrats, scholars and engineers specializing in advanced technology and would make decisions which need high political judgment.

In practice, these experts would form a group of advisers who would work in the process of policymaking. Naohiro Amaya, former director-general of the Natural Resources and Energy Agency, and Kenichi Koyama, professor of Gakushuin University, are mentioned as possible members of the think tank.

Nakaido is well known for his abhorrence of bureaucrats. The idea of the think tank devoted to party-led policymaking was conceived when he served as the chief cabinet secretary of the Tanaka cabinet in 1972.

Although I referred to a "Soviet-type" regime, this method is not limited to the Soviets. A similar phenomenon is also

seen in the ruling Social Democratic Party of West Germany.

West Germany's ruling party is led by Willy Brandt and the government by Chancellor Helmut Schmidt. High-level political policymaking, such as strategy against the Soviet Union, is greatly influenced by the party.

It is not known if Nakaido's think tank concept has been formed after taking into account the cases of the Soviet Union and West Germany. But the concept calls for forceful actions by the Liberal-Democratic Party to lead the nation's bureaucratic setup into productive work, in place of its usual token obedience, as was done by the party in trying to solve the trade friction with the US and European countries.

But competition over hegemony of foreign policy between Nakaido and Miyazawa and a strong feeling of rivalry as "new LDP leaders" between Miyazawa and Tanaka also certainly seem behind the idea.

Although using a policymaking staff in the party to gain stronger influence over the government's policymaking is an understandable tactic, it may all come to naught.

Even though the slogan "the party's leadership" has its appeal, the "new idea" most certainly will run into extreme difficulties, like administrative reform, in confronting the bureaucracy. And the bureaucracy after all dispenses benefits to its friends.

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ECONOMIC

LDP DIETMEN'S VIEWS ON U.S. RELATIONSHIP

Research Commission Head Comments

Tokyo THE DAILY YOMIURI in English 25 Apr 82 p 1

[Article by Hyosuke Niwa, chairman of the Liberal-Democratic Party research commission on comprehensive agriculture: "Japan Cannot Afford To Liberalize Farm Imports"]

[Text]

It has been pointed out in the US that the trade imbalance between Japan and the US is due to problems faced by foreign goods, particularly agricultural products, in gaining access to the Japanese market.

But the Japanese market is not as closed as the US thinks. It is wide open.

Japan has been contributing greatly to the development of trade in agricultural produce while overcoming its difficult domestic situation.

Japan's imports of agricultural products have expanded year by year and it has become one of the world's largest importers.

According to the latest statistics, Japan suffers from a deficit of \$9.8 billion in terms of trade in agriculture, forestry and fishery produce while it enjoys a surplus of \$13.3 billion in terms of the total trade balance.

Imports of agriculture, forestry and fishery produce total \$10.2 billion and their place in domestic consumption has risen from 39 percent to 99 percent for cereal forage and four percent to 29 percent for beef in past 20 years.

As a result Japan's food self-sufficiency rate stands at 53 percent in terms of calories. This is a very low figure among advanced countries.

Efforts Made

In view of such facts it is evident that Japan has made efforts to liberalize agricultural products, has offered its market to the rest of the world and has contributed to the prevention of trade imbalance.

Japan is also paying greatest consideration to expanding import quotas for goods with residual import restrictions.

Nevertheless, protection of Japanese agricultural products is criticized. Unlike industrial products, agricultural produce involves difficult problems which cannot be settled according to the principles of free trade. The US and the EC have protective measures at their borders for agricultural products and there is no reason why only Japan should be the only one to get the blame.

Agriculture does not just provide food, an indispensable necessity in people's lives. It also serves an im-

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portant role in stabilizing the economic and social development of a country. In this sense it exhibits a trait that cannot be regulated by the free trade principle alone.

US Also Has Curbs

Even the US, which is the largest exporter of agricultural produce, has one item under residual import restrictions and more than 10 items on restricted import.

The EC maintains protective measures for 60 staple items through variable surcharges and each member country has its own separate import restrictions for other items.

Japanese agriculture is in the disadvantageous situation where an average farm is one-150th the size of one in the US and the price of farm land is 30 times the US.

It is almost impossible for Japan to overcome such conditions and match foreign countries.

Japan is constantly trying to build up its agricultural structure but the current residual import restrictions are the final step which Japan cannot concede.

It is very unfair to criticize only Japan's residual import restrictions.

If the rate of increase in imports of agricultural products and the residual import restrictions are compared to foreign coun-

tries, it ought to be stated that we cannot meet the demands of our critics.

Although it is pointed out that the Japanese people would like the freedom to buy cheaper beef and oranges, Japanese agriculture is aimed at increasing productivity and maintaining domestic agricultural production in order to meet the demands of people including consumers.

Japanese agricultural products, particularly those which need vast tracts of land for production have to set rather higher prices compared to imported goods. But the price difference is dwindling thanks by price setting which takes improvements in productivity into account.

What concerns the Japanese people is that domestic agricultural production alone cannot even supply a total calorie equivalent to what was available around 1945 just after the war.

Growing Concern

Under the circumstances, there is growing concern that a secure food supply be maintained and the Diet has unanimously adopted a resolution aimed at building up self-sufficiency in food.

Given these factors Japan cannot liberalize imports of agricultural products. Even if they are liberalized, the effect would fall far short of correcting trade imbalance.

The plight of Japanese farmers is such that production of some goods is restricted because of oversupply. As a result they are suffering from dwindling incomes.

Japan is now attempting to build up the structure of its agricultural sector by reorganizing production techniques and fostering "core" farmers.

Serious Damage

Liberalization will heavily damage this project and as a result Japanese agriculture will have no bright prospects for development.

Even when residual import restrictions are lifted in accordance with US demand, it will be impossible to correct Japan's trade surplus of \$13.3 billion with the US only through this measure.

If so, demands for liberalization are certain to be accelerated. As my stand favors protecting Japanese agriculture, I must avoid taking such an action as to jolt Japanese agriculture.

It is only natural to increase the rate of self-sufficiency in foods as they are indispensable to all the people. In this sense it is necessary for Japan to encourage policies aimed at enhancing productivity to enable Japanese agricultural products to compete with foreign products in terms of prices in any difficult situation.

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Congress Urged To Change Policies

Tokyo THE DAILY YOMIURI in English 26 Apr 82 p 1

[Article by Ichiro Hatoyama, member of the House of Councilors: "US Should Pursue Different Economic Policies"]

[Text]

Senator Donald W. Riegle singled out the automobile trade issue and said he had introduced a bill calling for a reduction of Japanese auto imports to 14 percent of US sales.

Last May, we enforced voluntary auto export restraint recognizing that the automobile industry is equally vital for Japan and the US and that we must prevent the US auto industry from unrecoverably suffering by a sharp rise in Japanese auto exports.

Although the curb took the form of a unilateral Japanese action, it was actually the result of negotiations between the International Trade and Industry Ministry and the US Trade Representative.

Just before the restraint went into its second year in April, we made it known that our auto exports would be limited to the same 1,680,000-unit level as in the first year. The announcement was welcomed by the US Trade Representative.

Our auto export reduction to 1,680,000 units last year resulted in a 3 percent decline from the preceding year. We made the promise and carried it out in good faith.

A certain senator who visited Japan in January urged us to maintain the restraint at 1,680,000 units a year. He did not press for a further cut. Therefore, Senator Riegle's insistence took us by surprise.

He made the point that the Japanese share in the US auto market rose to 24 percent in the first two

months of this year. The rise seems to be quite natural because auto sales in the US depend on the general economic performance there.

High Interest Rates

The present US administration is pursuing a policy of strict monetary restraint, high interest rates and a strong dollar in its fight against inflation. One result has been a steep fall in housing starts to a yearly level of less than 900,000 units, a level only a half of the peak years.

For automobiles, the impact may not be so severe as housing, but a substantial sales decline is simply inevitable.

Last year's auto sales in the US were 8,530,000 units, a drop of 450,000 from a year earlier. There might be a further decline this year if interest rates remain on the same high plateau.

Japanese automobiles are small and the strong dollar gives them a price edge. It is likely their share in the US market will rise this year as well.

In my opinion, the present US policy of tight money should be shifted as soon as possible to restore a normal level of interest rates.

There has been a substantial easing of inflationary pressures in the US and price rises are being held within a yearly rate of 8 percent.

Must Switch Policy

When I visited the US recently as a member of a Liberal - Democratic Party mission headed by Masumi

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Esaki, I was informed of bankruptcies of housing loan institutions. There must be a switch in the economic policy and I count on the influential members of Congress to press for it.

If and when the US interest rates come down to a normal level, a rise of 700,000 to 800,000 units in auto sales would not be difficult.

Senator Riegle also pointed out we had reneged on our earlier promises to purchase more US-built auto parts.

My personal survey showed that Japanese automakers are invariably trying to increase their purchase of US parts. Last year, the figure came to \$80 million. This figure would have reached \$320 million if we count the US parts bought to equip Japanese autos in the US.

The talk on our purchase of US parts was essentially aimed at enhancing co-

operation between Japanese and US automakers. It is my deep regret that Senator Riegle called it a breach of promise.

Car Industry Vital

The auto industry is vital to both countries. There is a need for broad cooperation. Talks are under way for possible production in the US by one of the top Japanese automakers. I hope Senator Riegle takes a long look at this problem.

Finally, I have to discuss the choice between protectionist and free market principles to rule the international trading system.

Western countries have so far abided by the free trade principle. It should not mean unlimited freedom that lets the weak fall prey to the strong. As admitted by GATT negotiations, each country can protect domestic industries to a certain extent.

During the recent visits

of the Esaki mission to the US and Europe, the central topic was freer access to Japanese markets. Today, we are doing our best looking for an optimum second package to respond to their calls.

Aimed At Japan

The import curb bill proposed by Senator Riegle seems to be aimed at only Japan. Bills of this sort do nothing more than dash cold water on our ongoing programs to open our markets.

No other times require so strong a need for partnership among free countries. It can be attained only through a further expansion of global trade, not reduction.

We are well aware of our faults to be corrected. We are trying so hard to enhance our cooperation with other countries. Action rather than words is needed. And we have to produce solid results.

Avoid Destruction of GATT

Tokyo THE DAILY YOMIURI in English 27 Apr 82 p 1

[Article by Masumi Esaki, chairman, Liberal-Democratic Party's committee on external economic relations: "US Must Avoid Destruction of GATT System"]

[Text]

More than 10 million people are out of work in the US and I saw with my own eyes the effect that stagflation had had on its economy. The economic difficulties were far worse than I had previously imagined. The same can be said of the European Community nations.

The economic problems have now become political issues. In France, the ruling Socialist Party led by President Francois Mitterrand lost local elections by a wide margin in March. In West Germany, the opposition Christian Democratic Union (CDU) overwhelmingly won a state assembly election in Niedersachsen (Lower Saxony) State.

There are both pros and cons to Reaganomics but the ultimate success of this policy rehabilitating the US economy is in serious doubt. On top of this, the US off-year elections are around the corner.

US legislators have focused their growing frustration on the Japan-US trade imbalance, which is \$18 billion in favor of Japan. They take the easy way out by explaining that the deterioration of the US economy has been brought about because the Japanese market is closed.

In order to cooperate with the US and Western Europe in their efforts to revitalize their economies, Japan has advanced by two

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years the implementation of reduced tariffs agreed upon at the Tokyo round of multilateral trade negotiations while removing non-tariff barriers to a level similar to that existing in the US and West Europe.

Guise Of Reciprocity

Despite this, moves have been made to submit protectionist legislation to the US Congress under the guise of seeking reciprocity which, in the true meaning of the word, is a concept that can be equated with the spirit of fairness. But the problem is the content of the proposed "reciprocity" bills.

Many of the proposed bills run counter to the spirit of the General Agreement on Tariffs and Trade (GATT).

For example, the bill submitted by John Danforth, chairman of the Senate finance subcommittee on international trade, is designed to allow retaliatory actions to be taken in connection with ordinary trade if problems arise in the field of services and investment.

The definition and objectivity of the bill remains obscure but it is feared that the bill's provisions would be applied at any time the US felt like it.

Application of such a bill means that a country can arbitrarily ignore international trade rules based on the GATT which guarantees fair, equal and free trade.

Retaliatory Steps

A country, which finds itself the object of trade restrictions through the "reciprocity" principle, might retaliate and repeat retaliatory steps by both

sides will not only lead to a confrontation between the two countries concerned but also affect third countries. This could result in all countries adopting protectionist policies.

This would mean the re-emergence of the nightmare the world faced during the Great Depression in the 1930s. There is a proverb which goes: "Only a fool makes the same mistake twice."

Since the early 1800s when the Monroe Doctrine prevailed, the US policy has been to ensure a self-sufficient and independent national economy.

The US, the world's leading economic power, must avoid the mistake of destroying the GATT system and introducing protectionism, which would only bring about chaotic conditions for the economies of the world.

In this respect, the bill proposed by Senator William V. Roth (Republican-Delaware) is more moderate than other "reciprocity" legislation.

With the revision last year of the Foreign Exchange Control Law and the enactment in April of the new Banking Law, Japan gives foreign companies the same treatment in the fields of services, banking and insurance as that granted domestic firms. Therefore, no problems exist in this respect as far as Japan is concerned.

Problems in the field of services in the broader sense include those involving distribution. True, the distribution system, which is based on long-standing traditions and customs, should be streamlined but it is unreasonable to tackle this problem on a bilateral basis.

It was agreed at the Ottawa summit of seven industrial nations last year to discuss such a problem on the basis of GATT.

Distribution System

Streamlining the distribution system will contribute greatly to the promotion of trade among industrially advanced nations and, in this sense, Japan must improve the situation.

In connection with Japan-US trade issues, Japan has been voluntarily restricting exports of automobiles, steel and electronics equipment as requested by the US.

It was decided in March to limit the export of automobiles to the US to 1.68 million units in fiscal 1982, the same level as in the previous fiscal year. US imports from Japan account for 13 percent of total US imports, while Japanese imports from the US amount to 9.4 percent of this country's total.

Is Japan Responsible?

Is Japan really responsible for the fact that 10 million people are out of work in the US when we consider these figures and compliant moves on the part of Japan?

The economic situation in the US has become so serious that the US is calling on Japan to take positive action instead of merely debating the issue. Now Japan is going ahead with new plans on its own responsibility to revitalize the economies of the West.

The US should use a sense of proportion and take the initiative as a leading advocate of free trade in collecting ideas from all countries in the Western bloc to establish a new economic order.

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Trade, Defense Link Noted

Tokyo THE DAILY YOMIURI in English 28 Apr 82 p 1

[Article by Kichizo Hosoda, chairman of House of Representatives ad hoc committee on security: "Americans Link Defense With Trade Issue"]

[Text]

US opinions about the defense of Japan in the past couple of years have been extremely diverse. Since last autumn, various resolutions have been submitted to Congress and from the beginning of this year the defense issue has been discussed, together with the trade problem at public hearings and other forums.

Mr Levin's arguments seem to me to be a reiteration of what has been said in these discussions. They are persuasive and exude common sense and if we Japanese question their validity or oppose them, we will be, in Mr Levin's words, "an ally whose concerns for its own selfish, economic well-being eclipse what should be a more important consideration—maintenance of mutual security, peace and democracy of both nations."

I would like to briefly comment on some noteworthy points in Mr Levin's article. In general, he accepted the Japan-US joint declaration issued by Prime Minister Suzuki and President Reagan last May and Prime Minister Suzuki's speech at the National Press Club in Washington which, in a sense is a commentary on the joint statement and he urges Japan to honor the commitments it made. He says this is of serious concern in Japan as well as the US.

Difference In Views

Mr Levin also mentions the threat to peace, freedom and democracy mentioned in the Japan-US joint statement. Regrettably, I must admit that there is a considerable difference in views on this point between the Americans and the Japanese.

He also criticizes the argument, often heard in Japan, that foreign aid is more important than improving the nation's defense capability.

Defense and trade problems are not connected, he asserts. Officially the two issues may be separate but the Japanese must bear in mind that they are in fact inseparable to Americans regardless of what they may say.

Mr Levin proposes that Japan should make the minimum necessary defense effort. He says that Japan, as a member of the Western camp, should "make an equitable contribution to our common defense by achieving, as soon as possible during the 1980s, the real military capability to undertake its own defense to the extent articulated by the Japanese Government's own defense policy statements and agreed to commitments."

He says that Japan should undertake the defense of its sea-lanes up to 1,000 miles from its coast and contribute to the security of the Pacific.

The 7.754 percent growth in defense spending in the government's fiscal 1982 budget, he says, is insufficient and the argument that this growth rate is higher than that for social welfare and therefore demonstrates the government's good faith is accepted only in Japan.

Size Of Budget

The size of Japan's defense budget is far removed from the sacrifices being made in the US to procure funds for defense.

When US Secretary of Defense Caspar Weinberger recently visited Japan he met with Japanese Govern-

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ment officials and called for greater defense efforts in the future.

Japan is beset with problems concerning the fiscal 1983 budget, national economy and administrative reform. Given this situation, the government and the Liberal-Democratic Party (LDP) must determine the size of the defense budget which will embody Japan's defense efforts in the coming years.

Problem Studied

The LDP Security Research Council, chaired by Asao Mihara, set up a com-

mittee for improvement and expansion of Japan's defense capability and is studying the problem. It is high time that the committee was drawing conclusions.

It should give its recommendations on such problems as the 1981 mid-term defense equipment purchase plan and the percentage of defense spending to the GNP and endeavor to win public understanding.

This is a problem for Japan, not the US. It is a problem related to the basic mutual trust existing between Japan and the US as allies.

Need To Know Each Other

Tokyo THE DAILY YOMIURI in English 29 Apr 82 p 1

[Article by Toshio Kimura, member of the House of Representatives: "Play it Cool in Resolving Pending Issues"]

[Text]

A special and close bond was forged between Japan and the US back in 1951 when they signed the peace treaty in San Francisco.

Three decades after passing that memorable milestone in their histories, the two nations find themselves on the threshold of an even more mature relationship.

With a host of serious issues hanging over the world, such as a direct threat to global peace and stability, the need for a revitalization of the global economy and a stable development of the Third World, Tokyo and Washington need to put their cooperation on a still firmer footing.

In a broader context, it's needless to say, the Western camp should remain closely knit.

And Japanese-US ties form a major pillar of the Western alliance.

Washington, pointing to an increasingly harsh international climate, expects Tokyo to build up its defense.

On the economic front, too, Washington is seeking Japan's cooperation to ease the deepening friction in bilateral trade; US officials also realize the business picture at home is far from rosy.

What contribution can Japan make to cement its American bond? What is expected of Tokyo in unraveling a raft of pending issues?

Defense

A resolution presented by Representative Clement J. Zablocki (Democrat, Wisconsin) points up the latest congressional bid for Japan's defense buildup.

While giving due heed to such American expectations, Japan's basic stance is to map an independent

course for boosting defense capabilities within the framework of the constitution.

For fiscal 1982, the defense budget has gone up 7.8 percent on 1981, despite a burst of outcry against a marked hike in such funding. The new defense appropriations, backed by highly political considerations, will cover purchases of F15 fighters, P3C anti-submarine aircraft, destroyers, etc.

I don't subscribe to the oft-repeated criticism that Japan isn't meeting its defense obligations.

The defense budget aside, Japanese-American cooperation has been making steady headway in such fields as joint strategic studies and war games.

What I presume nettles the US is Japan's pace of defense buildup.

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The Americans calculate Japanese defense spending as a percentage of GNP or of the overall budget—an approach that isn't necessarily constructive.

What is essential, as I see it, is a deepening of mutual understanding and a constant swap of views on what Japan should and can do under the bilateral security treaty.

A revision of the treaty has been called for both in Japan and the US. Is there any need for the amendment? The pact is properly functioning.

Economic Ties

True, both countries are confronted with knotty economic problems, yet one can't deny that Japanese-American commerce has yielded some dividends, benefiting both. Why do some people overlook these plus factors?

An unemotional, well-balanced approach is in or-

der in assessing the economic relations. Notable progress could be cited in such fields as industrial cooperation, investments in each other, an exchange of service industry know-how, etc.

The Americans have been demanding that Japan liberalize its market to just about the same extent as the US has already done.

What's missing in the American argument is acknowledgement of each country's marketing peculiarities, which could be linked to its social evolution, customs and so forth.

An objective yardstick is hard to come by in deciding whether this market is open or that one is closed. And emotionalism leads to nowhere.

The Japanese ask: Aren't overseas reports going too far about the "closed nature" of the Japanese market?

They point out that some American complaints on Japanese marketing have obviously been caused by misunderstandings.

Japan should of course try to project an undistorted image of itself through public relations efforts.

But we also would like the Americans, above all Congress and the Reagan administration, to study a bit more about Japan.

Japan, in fact, has taken a series of steps over the last couple of months, including tariff cuts on some items two years ahead of schedule as agreed on in the Tokyo round of multinational negotiation; Tokyo has also done away with or relaxed nontariff barriers, simplified import procedures and opened the governmental Office of Trade Ombudsman.

Such efforts should be mutual; a "buy American drive," for instance, can be dispensed with.

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ECONOMIC

TOKYO COLLOQUIUM DISCUSSES JAPAN, WORLD ECONOMY

Tokyo THE DAILY YOMIURI in English 12-16 Apr 82

[12 Apr 82 p 5]

Need for Cooperation With Other Nations

[Text]

The following is a position paper presented by Seikei University Professor Miyohel Shinohara, who was moderator at a recent symposium held in Tokyo under the theme "Japan in the Context of the World Economy." Excerpts of the discussion, including the moderator's notes, are carried on this page in five instalments beginning today.

Participants were Heinz W. Arndt, professor emeritus, Australian National University; Dick Wilson, writer on Asian affairs; Saburo Okita, chairman, Institute for Domestic and International Policy Studies; and Susumu Nishibe, associate professor, Tokyo University.

The symposium was organized by Tokyo Colloquium and sponsored by The Yomiuri Shimbun.—Editor.

* * *
In 1950, the production of crude steel in Japan was only 5.5 percent compared with that of the US. For automobile production, the percentage was almost zero. In 1980, Japan surpassed the US by 10 percent in both crude steel and automobile production. Essentially, then, since the US population is double Ja-

pan's, per capita output for both items in the US was about half that in Japan. This massive production, of course, cannot be completely absorbed within Japan itself, and the steel and car industries in particular have grown increasingly and overwhelmingly dependent on export.

Japan now exports about half of its automobiles and about one-third of its steel, and this has inevitably become the source of severe friction over trade with other countries.

The problems ensuing from the phenomenal increase in Japan's economic strength may be divided between those involving the industrially advanced nations on the one hand, and the Third World on the other. This same distinction is one that must be made when considering Japan's role in international society as well.

Trade friction among the industrially advanced nations is now the focus of attention all over the world. Just as did the US before it, Japan now strongly advocates free trade from its standpoint as a strong economic power. Practically, however, it has encountered many occasions where it is

forced to impose political settlement because of economic difficulties experienced in other countries or in defense against the accusation that it is getting a "free ride" in military security affairs.

This has led to the impression in Japan that the established economic principle of free trade is gradually being overruled. But if international negotiations are being conducted in this manner, it brings to the fore the question as to whether such negotiations might be reduced to mere bargaining with no basis in consistent principles or restraints. To avoid this, every effort must be made to discuss free trade in its specific, concrete contexts. A new economic principle must be identified that takes into concrete consideration all the various problems we now confront in order to achieve a balance in the world economy.

To what degree should the principle of free trade be modified? How should industrial cooperation and export restrictions be implemented? It is these questions to which the industrially advanced nations must direct their efforts at achieving a consensus. In any event, it is dangerous

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and unwise to allow the political settlement of such matters without reference to a given unifying principle.

Another important question is how Japan's economic assistance should respond to the diversification among Third World countries. First of all, with regard to the least developed countries (LLDC), Japan should naturally emphasize humanitarian relief for the starving, its aid corresponding to the basic human needs of these countries. As for the NICs (newly industrializing countries) or those countries which will soon "graduate" from the status of developing country, Japan's efforts should be focused on aid to industrialization through transfer of industries from Japan — ie, international adjustment of the industrial structure.

In its relations with the oil-producing countries, Japan must help to sustain the oil market as a buyers' market by cooperating with other countries in concerted efforts to convert to nonoil energy sources and in energy conservation, thus deterring arbitrary increases in oil prices. It can also contribute to stability in the energy supply by extending economic assistance to neighboring countries. Japan must also play a role in building a coop-

erative system among the advanced nations so that recycling of oil money will promote the expansion of production in nonoil-producing developing countries.

In the world economy in the remaining years of this century, no single, dominant country will be able to control other nations. Economic multipolarization will prevail; it will be a dynamic time of "catching up" in which newly industrializing countries (NICs) will catch up with advanced nations, and developing countries will in turn make gains on the NICs. The bargaining power of the Third World, especially of the oil-producing countries, will increase, making it an era of negotiation. Economic exchange will force different countries to be in constant communication with one another, ushering in an age of cross-cultural contact.

Great care must be taken to ensure that such contact does not result in increased cultural conflict. We have never been so much in need of mutual understanding as we are today. An overemphasis on either cultural relativity or uniqueness is undesirable, for it could produce confrontation deriving from self-assertion among countries that might prevent effective dialog. At the same time, if too much

emphasis is given to universality at the expense of cultural uniqueness, dialog can easily become one-sided, as has often been our experience in the past. A powerful country, for instance, may end up exploiting weaker countries if it insists on free trade without proper attention to the full economic context. In this sense, all nations must strive both to appreciate each other's cultural peculiarities and to identify those things that are universal or commonly shared.

Some people tend to think that the Japanese management system is unique, that is, so lacking in universality that the principle of free trade cannot be strictly adhered to. These people do not seem to be aware that every culture displays universality to some degree or other. On the other hand, there are those who believe in the universal qualities of Japanese culture so thoroughly that they tend to underestimate its peculiarities.

Japan's role in international society from now on should be that of neither arrogant leader nor servile follower. It must work together with other nations in the world, sharing feedback on vital issues of concern, and in this effort Japan may be able to play a special role as coordinator.

To be continued

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[13 Apr 82 p 5]

[Text] Trade Rows and Payments Balance Issue

This is the second of five instalments of excerpts of discussion at a recent symposium held in Tokyo under the theme "Japan and the World Economy."

Participants were Heinz W. Arndt, professor emeritus, Australian National University; Dick Wilson, writer on Asian affairs;

Saburo Okita, chairman, Institute for Domestic and International Policy Studies; and Susumu Nishibe, associate professor, Tokyo University.

The symposium was organized by Tokyo Colloquium and sponsored by The Yomiuri Shimbun.— Editor.

* * *
Shinohara: Japan's relationship to the international economy has two different aspects. One is its relationship with the advanced industrial economies of the world and the other is its relationship with the Third World economies.

I would suggest that we devote ourselves first to Japan's relationship with the advanced industrial economies.

It seems to me that the traditional theory of free trade has been based more or less on static assumptions. However, since the early days of the growth and development of capitalism, conditions have never been really static. Sometimes it has been the US that has grown and prospered. At other times, it may be Japan's turn to catch up with the US.

In other words, there are many dynamic factors that constitute the world's economic development. So even though one can argue that the theory of free trade is a plausible one, if trade is just left to grow as it will, it may occasionally have a very adverse impact upon some countries.

Considering the nature of the age in which we live, I think it is high time that we reexamine the accepted theories of international trade. And in light of Japan's having become such an economic giant, it would be particularly appropriate for us to reconsider the free trade theory.

The nature and character of the Japanese people is such that we don't insist on the logic of things.

When faced with external pressures, we are instead prone to attempt to settle the matters in a political way. I think this approach is highly problematical. While, realistically, we do need to take into account political pressure, as long as we are a part of the world economy, I think we also need a set of rules to follow. We should not be

merely forming consensus on an ad hoc basis from time to time without firm principles.

Balance Of Payments

Arndt: Professor Shinohara's reference to the static nature of traditional trade theory makes me feel very unhappy. I believe it is at least ambiguous to refer to the case for free trade as being based on static considerations. Many have stressed the dynamic benefits, including me, on problems of the developing countries of Southeast Asia, countries which stand as an increasingly effective example of the dynamic benefits to be gained from outward-looking policies.

There is a tendency associated with references to Japan as an industrial giant to think that Japan can now produce everything more cheaply than anybody else. That of course is the proposition which Ricardo attacked by saying what matters is not absolute but comparative advantages. No country can have a balance-of-payments surplus indefinitely with the whole of the rest of the world. The most obvious method of adjustment is either domestic price changes or changes in the exchange rate, and, sooner or later, if the overall balance of payments is brought into equilibrium, even Japan will have a comparative disadvantage in the production of some things.

The situation reminds one of the postwar years when we all talked about the terrible dollar shortage. The US appeared to have a balance-of-payments surplus with everybody else, and this was interpreted as a dollar shortage. Economists gradually persuaded politicians and the public that this was a nonsense concept, that there was a dollar shortage only in the sense that in the postwar years British and Europeans tried to buy more from the US than they could afford

to pay for. In due course, the Americans overcame this so-called dollar shortage, first by loans and grants, and then capital exports, and gradually by change in their comparative advantage.

We don't ever talk about the yen shortage because we don't think of the yen as a reserve currency. But the problem of Japan's balance of payments, such as it is, is exactly analogous to that of the US dollar balance of payments in the early 1950s, and the solution is, in the longer run, basically the same.

Seeking Scapegoats

Wilson: In Europe I believe many people think of the current relationship with Japan in terms of a kind of competitiveness gap. The economic reasons for this gap are straightforward, I suppose, for Europe and the West in general. In our case in Britain, we are aware that our industries have not reinvested enough in the past, perhaps because they have had to pay too much tax.

For sociological reasons there has been a gradual erosion of the work ethic in Britain and in other Western countries. This is something apart from the trade gap, but it has led to the trade gap. The trade gap in itself is not very important. Truly speaking, in today's multilateral world trade system, the competitiveness gap is more worrying because if it persists or worsens things are going to be very difficult.

In normal times these things can be absorbed, but in a period of recession absorption isn't so easy, and so we seek scapegoats. A Japanese trade surplus is unacceptable, it seems, on the scale in which it has built up in Britain and Europe today, while an American surplus of similar magnitude goes unnoticed and without comment.

So, sensible people on

both sides are trying to salvage what is salvageable of free trade in this difficult period. Thus, it so happens that, on the whole, it is the Japanese rather than the Europeans or Americans who are arguing for free trade.

Of course, Japan is not in fact a free-trade country. There is a large sector of agricultural products—items like silk and leather—in which Japan is protectionist. For this reason, it is beneficial if Japan's advocacy of free trade is tactful.

Japan was not a free trade country 20 or 30 years ago. It is relatively recently that liberalizations have been brought in, and the view is beginning to spread in Europe that it is most regrettable that European firms did not make a big enough entry into Japan 10 or 30 years ago when the opportunities were greater and costs were lower and when the bargaining power, so to speak, of Western enterprise was bigger, rather than to have left it instead to today, a time when it is uneconomic for most Western corporations to set up new exporting operations in Japan on a very large scale.

And, of course, the other way around, Europe was a free-trade thinking area in the 19th century when it was competitive, but now it is becoming protectionist.

We have a body in England called the Trade Policy Research Center which does a lot of propaganda—if I may use that word—for free trade, putting out good intellectual arguments and constantly relating current issues in Britain to free-trade principles. I personally would like to see more of this kind of work and indeed more thinking on things like the role of invisible trade in this whole issue.

So my comment comes down to this: that, from the political point of view, everybody is perhaps at fault in this situation, and

that it is rather useless to keep blaming each other. What is needed is for people to subdue their emotions and conduct a rational dialog.

Trade Friction

Okita: When we consider the trade frictions between Japan and the other advanced nations, one perspective that we should take is that of a dynamic international division of labor.

With such a division of labor, over the long run each nation would, of course, see a change in its comparative advantage. In other words, it would lead to a change in the worldwide trade flow. No country, whatever its desires, would be able to enjoy and preserve the status quo.

In that sense, Japan is facing the same competitive challenge. We are already seeing some challenge from the Southeast Asian nations, including South Korea and Taiwan. In the future we will see an additional challenge from China. In other words, I think we need to make an industrial adjustment here in Japan, and, in fact, a process toward such change is already taking place.

As things stand now, I think we can break down the frictions vis-a-vis the US and Europe into short-term and long-term problems.

Looking first at the short-term problem, let me cite, for example, the US criticisms of Japan. Those criticisms take different forms, but in keeping with what Mr Wilson said earlier, I think they overlook the invisible trade balance as well as multilateral settlements. In other words, America is criticizing Japan solely on the basis of commodity trade. As we economists are continually asserting, this is an error. It is the wrong approach.

Looking for example at the trade balance between the US and Japan for the year 1980, we see that, ac-

ording to the statistics of the US, the US was in deficit of \$10 billion vis-a-vis Japan. Looking further, however, we also see that in the same year the US enjoyed a surplus in commodity trade of \$17 billion vis-a-vis the European Community.

In that same year Japan had a deficit vis-a-vis the Middle East nations of \$30 billion.

Another thing that should draw our attention is that the international balance of the US is changing in terms of structure. When we look at US balance in commodity trade, we see that the US has been having a yearly deficit on the order of \$25 billion, whereas when we look at the invisible trade—that is, trade in services, the US has been enjoying a surplus of over \$30 billion.

But the situation in Japan is just the reverse. Although Japan has a trade surplus in commodities, when we look at the invisible trade balance, we see that each year Japan has a deficit of approximately \$13 billion.

Therefore, I think we can say that as far as overall current accounts are concerned, the situation is better for the US than for Japan. It is merely America's commodity trade balance, her bilateral trade balance vis-a-vis Japan in the commodity sector does not show a good picture.

Another point I have has to do with the exchange rate. If things worked as they should, there should be a change in the dollar-yen exchange rate which would serve to suppress Japan's exports. However, because of the Japan-US interest-rate differential, due mostly to the abnormally high interest rates seen in the US at present, the high value of the dollar in relation to the yen has served to spur Japanese exports to the US even further.

Therefore, what is neces-

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sary to an early solution is a lowering of interest rates in the US.

National Interests

Nishibe: It seems to me that as intellectuals speak out in Japan or abroad, they appear to be speaking excessively in terms of their countries' national interests. Of course, no one is free from the ties to the nation or society to which he belongs, but I think that for intellectuals to play a really useful role, they should free themselves as much as possible from such identification. I would, therefore, like to speak up without particularly identifying myself with my own country.

Just as the United Kingdom in the mid-19th century, which saw itself as the factory of the world, regarding all other nations as either raw-materials suppliers or customers for their country's products, Japan today seems to have become an ardent advocate of free trade, and I do of course appreciate the several benefits that accrue from such advocacy.

In order for all countries to benefit from free exchange and trade in a truly voluntary fashion, it seems to me that you need conventional trust between the countries concerned. Trade and other international frictions, whether you like it or not, do inevitably impair such trust between nations.

In order to demonstrate the need for such mutual understanding, I would like to quote two illustrations. One has to do with opening up the domestic Japanese market.

All too often Japanese utterances in refuting criticism from America or Europe tend to be aimed at countering European and

American complaints about the complexity of the distribution system in Japan or else pointing out to Europeans and Americans that they have not sufficiently studied the very delicate consumer preferences in Japan.

There is a good deal of truth in this Japanese attitude, but if Japanese are truly sincere about opening the market, we might well make it easier for foreign interests to have access to the Japanese market by doing something positive and concrete. That would be a logical thing for the Japanese to do. In reality, however, I see very little evidence of any positive efforts in that direction.

Conversely speaking, however, it is highly inappropriate for Americans and Europeans to be merely griping about the complexity of Japan's distribution system or the too sophisticated nature of consumer preferences. Instead, Americans and Europeans should understand that such complexity of distribution and sophistication and efficiency of the entire Japanese economy.

The second example is about the well-known assertion that the Japanese are workaholics. To me the Europeans and Americans should try harder to understand that the Japanese people can survive only by working diligently. Conversely the Japanese people should also recognize that diligence is neither an absolute nor a universal value in this world. The Japanese should know that from the viewpoint of the people who don't regard diligence as a universal and absolute value, the kind of diligence the Japanese are well known for can indeed be very much of a nuisance.

(To be continued)

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[14 Apr 82 p 5]

[Text] Necessity of Revising GATT Rules

This is the third of five instalments of excerpts of discussion at a recent symposium held in Tokyo under the theme "Japan and the World Economy."

Participants were Heinz W. Arndt, professor emeritus, Australian National University; Dick Wilson, writer on Asian affairs; Saburo Okita, chairman, Institute for Domestic and International Policy Studies; and Susumu Nishibe, associate professor, Tokyo University.

The symposium was organized by Tokyo Colloquium and sponsored by The Yomiuri Shimbum.—Editor.

* * *
Shinohara: Let me go back to the earlier view I expressed about free trade. True that Dr Haberler did emphasize the dynamic aspect of free trade, but I would still like to argue that as a system of economic philosophy, the free-trade philosophy was based on very static conditions. Therefore, in discussing real world trade matters, I do not think it is sufficient.

I am not at all advocating controlled or managed international trade. I would be especially opposed to any sharply increasing, concentrated flow of certain merchandise in certain sectors of the world economy. In such cases, voluntary export restrictions may be justified or, indeed, may be required.

Too dynamic a growth of exports of any particular merchandise would indeed play havoc with, and effectively destroy, the order in international trade, but realistically I do recognize that from time to time sudden rises of new products or sudden increases in exports in fact affect the rise and fall of various nations

and national economies in the process of dynamic development. That I think is what Dr Okita was referring to as "a dynamic division of labor" internationally.

Seen from this point of view, I do not think it is sufficient, say, to invoke the safeguard provisions under GATT as a cushion while maintaining the principle of free trade.

It is not that I am obstinately arguing for the case of protection or export control. My point is that, in the interest of maintaining the overall free-trade principle and free-trade framework, it is not enough for us merely to practice what the textbooks say. We need a different mix of approaches.

Exchange Rate

Arndt: Dr Okita made, I think, a very important point when he referred to the problem of the imbalance resulting from international capital flows in response to the very high interest rates in the US. I think the sudden burst of exports of Japanese manufactures could be restrained very considerably if the exchange rate were enabled to adjust itself more to the current account. This is, I think, a very serious problem. We cannot really expect the US to give up the battle against inflation so long as they think that high interest rates themselves affect domestic macro-economic requirements.

Large-scale international capital movements can, of course, cause changes or prevent changes in the exchange rate which would be beneficial from the point of view of commodity flows. Perhaps one way of preventing these imbalances in the current account would be to impose some

sort of constraint on short-term international capital flows.

British Disease

Wilson: Professor Nishibe said that he was not going to use statistics, but the one that he did use I found a little bit interesting. He said that nations should deal with each other on a 50-50 basis. Now I feel compelled to react to that along these lines: that we find it difficult enough in our own societies to achieve equality between individual human beings — although that is something which we strive for, and rightly so — let alone to try to achieve it among nations, and I myself doubt if that would ever be possible. Indeed Japanese diplomats are among the first, I think, to complain privately about the difficulties of operating in the UN, where you have nations of 100, 200, 300 million people competing on a legally equal basis with countries of only a few hundred thousand of population.

Let me also think aloud a bit on the topic of workaholics. In Britain, and in Europe generally, we have a perception of ourselves as becoming less interested in work, less inclined to work, and that is also of course the case here in Japan. But the relative willingness to put in good long hours of work is still greater in Japan, I would say, than in most European countries. Is this a racial, ethnic constituent in the Japanese personality? We presume not. From general theory, from practical observation and historical evidence, is it perhaps more a cultural feature of the Japanese individual which is relatively recent? That is probably more like it, and in that case, it is something

that will change. We already see it changing, in fact.

One could put it in this way perhaps, that while the Japanese are catching the British disease and becoming less hard working, maybe the Britons are still in fact going down the slippery slope still at this moment to lower depths of leisure orientation, and this is perhaps a human trend all over the world.

Law Of Jungle

Okita: Earlier I talked about the short-term perspective, and especially over the past few months, I think we have been able to see quite substantial solutions forming to the short-term problems. But when we move our perspective to a more long-term problem, that of the competitiveness gap, I wonder if European products can really compete with Japanese products. I think this is a point which will have great impact on the entire problem of friction.

If I might cite my own opinion—and this is a point which has been raised by Professor Shinohara as well—rather than trying to pursue the rules under the GATT system, each nation seems to be bypassing them. In other words, nations are carrying out arbitrary, bilateral negotiations on a commodity - by - commodity basis. If such is the case, it would appear to me that world trade is being dominated more or less by the law of the jungle.

With this in mind, I submit that if we are to ad-

just the situation with internationally agreed rules, maybe we are at a time when the GATT itself needs reconsideration and restudy.

In my own view, in order to produce new rules for GATT that can bear the burden of changing world economic conditions, we must consider the following points.

First, I do feel that we need safeguard provisions of some sort, even if only for the purpose of addressing the question of the so-called torrential export expansion.

However, because people tend to mix together the matter of countering Japan's sudden export explosion and the question of export increases from the newly industrializing countries, or NICs, we have not been able to produce any viable answers. Therein lies the problem.

One solution in my view might be something along the following lines. We might conclude an agreement on some kind of mutual surveillance mechanism so that while safeguard provisions are being applied to a certain country, we can examine the situation and decide whether the countries invoking the provisions are making efforts to facilitate domestic industrial adjustment and to improve the efficiency of their industries. And if through such mutual surveillance we conclude that no effective adjustment is indeed taking place, we can then cancel the invocation of the safeguard provisions.

The next point encompasses the problem that Mr Wilson raised and Professor Shinohara touched upon. Under the present GATT rules, if an industry, for example, the US automobile industry, wouldn't get back on its own feet even with some kind of grace period for self-adjustment, such an industry should be allowed to disappear from the face of the earth. But realistically is such a course acceptable? Not quite, unfortunately.

That is why Japanese voluntary restraints on exports of automobiles to the US, while economically unjustified, politically and socially were something inevitable and unavoidable for Japan.

One more point has to do with the possible inclusion of voluntary export restraint provisions into GATT. In addition, there are questions such as some new rules within GATT governing service trade, international investments, and further liberalization of agricultural products.

On all these matters, it is not sufficient for governments alone to be discussing them among themselves. I think it important that among economists, also, there ought to be an international comparing of notes accompanied by solid theoretical argument so that all the views, not just those of governments, may be taken into account in producing whatever new direction or orientation is most desirable for revising GATT rules.

(To be continued)

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[15 Apr 82 p 5]

[Text] Advanced Nations Must Help Third World

This is the fourth of five instalments of excerpts of discussion at a recent symposium held in Tokyo under

the theme "Japan and the World Economy."

Participants were Heinz W. Arndt, professor emeri-

tus, Australian National University; Dick Wilson, writer on Asian affairs; Saburo Okita, chairman, Institute for Domestic and International Policy Studies; and Susumu Nishibe, associate professor, Tokyo University.

The symposium was organized by Tokyo Colloquium and sponsored by The Yomiuri Shimbun.—Editor.

* * *
Shinohara: The second topic is "Japan and the Third World Economies." I think it would be appropriate to ask Dr Okita, who is the most distinguished and well-known person in this field, to start off the discussion.

North-South Issue

Okita: I would like just to make a few less general remarks. The North-South summit was held in Mexico last October, but it is not very clear what contribution this summit made to any solution of the North-South issue. Of course, it was said that summit that we are to conduct global negotiations. But it seems that that we haven't seen any clear-cut progress in this regard, either.

With persistent stagnation, a desperately low economic growth rate, large numbers of unemployed, the advanced nations now seem to have much more interest in their own problems than those of the Third World.

Another factor is the Reagan administration's policy of emphasizing revitalization by means of private capital, and of downgrading public aid. This raises the question of how private capital of the advanced nations can contribute to the progress of the poor nations.

In the countries belonging to ASEAN (Association of Southeast Asian Nations) as well as in other East Asian countries we can observe substantial resilience. Even recently, most of them are enjoying and maintain-

ing an economic growth rate in the order of 7 to 8 percent. Therefore we see that despite higher oil prices and the passive aid policies of the advanced nations, the economies of these developing nations are showing a real dynamism. I feel that this is a point of great interest.

To the medium-to-high-income developing countries, I think the so-called Reaganomics has at least some applicability. There is a possibility, for example, that the World Bank can act as a catalyzer in promoting the flow of private capital into these economies. On the other hand, I think Reaganomics disregards the poor, low-income developing nations, leaving them, in effect, as they are. In any event, I feel that there is a certain limit as to how much private capital can do for these nations.

There are many things that the developing nations must concentrate on securing; namely, food, energy, transportation and infrastructures. I believe what may actually be necessary is to find a means to promote investment in these countries from both the private and public sectors worldwide.

Technology Transfer

Wilson: In general I would agree with all the points that have been made so often, that Japan could play a particularly helpful role in this area, particularly with economic assistance programs. In many respects, the Japanese program is now respectable. But it does seem to me that Japan has the ability to fill gaps in the European and American aid programs which are not being filled, and very much along the lines that Dr Okita has suggested.

But more importantly, I want to say something about the transfer of technology side of this, particularly in the field of textiles, which is one of the areas of voluntary export restraints that is actually already en-

compassed by machinery in the GATT, and is therefore likely to be regarded to some extent as a model for other commodities in the future.

I must confess to being puzzled still by the way in which the Japanese textile industry has adjusted itself to competition from the Third World. It has been done without any formal restrictions under the multi-fiber arrangement (MFA). And Japan is the only industrialized country which has not imposed any such restrictions. If Third World textiles could really enter freely into the Japanese market, then surely there would be more trouble in the Japanese industry.

I just raise this as an example of something that has grown out of a development in commercial and political terms over a period of a decade or two, and which could perhaps serve as a kind of indicator of how future Third World industries are going to be treated in the Japanese market, and how actually the problem is being solved. To me there is some mystery about it.

American Lesson

Arndt: The point that Dr Okita anticipated was the very marked and increasing divergence within the Third World between the middle- and high-income and the low-income countries. And one cannot help but feel that this divergence has very little to do with the international economic order or with anything that happens from without. The difference is overwhelmingly a problem from within, not even having to do with natural resource endowment but with cultural and other factors. And one doesn't quite know what the rest of the world can do about this.

A special issue of the London journal "Encounter" carried a very forceful statement of the view that the Brandt Report puts things almost 180 percent wrong in suggesting that

the problems lie outside these countries. But there is still, of course, the question of moral obligation to try and do something.

It would be very desirable if Japan increased her aid effort. But I think what happened to the Americans in the last quarter century is a warning to Japan not to expect thanks or popularity by giving a lot more aid. The Americans were denounced as neo-imperialists for having given aid—furthermore, having given most of it from humanitarian impulses.

I think Japan needs to realize that, if it does what everybody else expects them to do—give lots of more aid—they will become in some ways a lot more unpopular.

Selfishness

Nishibe: I would like to offer two rather passive and negative sounding notes. One is related to what Professor Arndt pointed out in terms of values one attaches to aid on the ground of humanism.

For example, though Japan has always had trade surpluses with many nations like Indonesia, Thailand and the Republic of Korea, we have never thought about these in any serious way. Only when we have been criticized by the US and Europe about our enjoying huge trade surpluses has Japan begun defending itself, trying to justify them. And only then did Japan become interested in strategic ways of giving economic aid abroad.

I do feel that underlying many of the reasons used to justify foreign aid are selfishly motivated, carefully calculated interests. Yet, in general, people tend to say that we do give aid for humanitarian or "love thy neighbor" reasons. In fact, even when we say, "We have to help the poor and save the sick and hungry children," it is difficult to say that our aid is not calculated in light of self-interests. And even though the devel-

oping countries themselves may demand aid for humanitarian reasons, the motivations underlying their demands are in reality more down to earth.

Although I cannot be absolutely sure, I am tempted to imagine that, humanism and empathy are not long-lasting, dependable values. Whenever economic friction arises, I imagine people are very anxious to throw away any such nice-sounding phrases. I think history has shown ample examples of this.

Having said all that, I don't personally have any good alternatives to offer. But at least I think our discussion should start with the basic admission that in the past foreign aid has had rather hypocritical underpinnings.

I'm afraid my second point also sounds equally negative and passive. Now, we all take it for granted that modernization, or industrialization, is something that the Third World countries are asking for and something that the industrialized nations encourage. But in the long-term view, if the various types of cultures and civilizations are to enjoy real coexistence, I am not at all sure that we can apply a monotonous, uniform, across-the-board kind of blueprint for industrialization or modernization to all of those countries, even though they may be demanding it in order for them to get out of their poverty.

It would seem to me that any transfer of technology or other form of economic aid must be carefully reviewed to insure that the technologies of the developed nations are organically combined and productively blended with the indigenous culture and social fabric of each recipient country. Again, I don't know of any effective methods to effect this. I only want to suggest that we should keep this consideration in mind.

Indonesian Example

Okita: Earlier Dr Arndt said that the more humanitarian aid the US extended, the more it seems that it was criticized. But I don't think that is true of aid from every source.

For example, when we look at the production of rice in Indonesia over the past 13 years, we see that it has doubled. Whereas it used to be approximately 10 million tons, at present it is over 20 million tons. In other words, aid in terms of technology transfers as well as capital aid extended by the World Bank, the government of Japan, the Asian Development Bank, Australia and the European nations, have contributed to quite an extent to the doubling of rice production in Indonesia. Such funds were used for fertilizers, developing new types of rice, as for irrigation.

In other words, as long as aid is utilized in a productive manner in the recipient country, I don't think there has been any repulsion or humiliation on the part of the recipient.

Moral Obligation

Arndt: In answer to what Professor Nishibe said, it seems to me that no government is ever allowed to act in any interest but that of its own country. And therefore to its own people a government always has to justify any aid as at least being in enlightened self-interest. And I have never felt that governments can be blamed for putting their national interests first. What we would like them to do is to act in a more enlightened manner. Countries like Sweden have shown that giving humanitarian kinds of aid is one way of increasing the respect of other countries. Not only that, such aid can be said to be in the long-term interest of the donor country. I believe we ought to give aid. I think it is the humanitarian duty and moral obligation of the rich countries.

The only point I would

make is that, in general, we ought not to think that we are going to get tremendous lot of gratitude from the people at large.

I also agree with Dr Okita on low-key transfers of technology. The noteworthy thing about IRRI (International Rice Research Institute) aid to agriculture, for example, is that IRRI produces new technology and doesn't charge anybody anything for it. It is almost always a free good, whereas manufacturing technology tends to be very largely protected by patents. That's a big problem.

(To be continued)

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[16 Apr 82 p 5]

[Text] Japan Likely to Play a Bigger Global Role

This is the last of five instalments of excerpts of discussion at a recent symposium held in Tokyo under the theme "Japan and the World Economy."

Participants were Heinz W. Arndt, professor emeritus, Australian National University; Dick Wilson, writer on Asian affairs; Saburo Okita, chairman, Institute for Domestic and International Policy Studies; and Susumu Nishibe, associate professor, Tokyo University.

The symposium was organized by Tokyo Colloquium and sponsored by The Yomiuri Shimbun.—Editor.

* * *
Shinohara: Our third topic is "Cross-Cultural Contact in the Context of Economic Interdependence." Professor Nishibe will lead off this section and, without further introduction, we will proceed to the last topic, "Japan's Economic Role in a Multipolarized World."

Ties With US, Europe

Nishibe: I would like to refer to cultural ties, for instance, between Japan and Europe, and Japan and the US.

Japan's success has been a success in industrialism and democracy. In other words, if Japan has performed well, I think it has done so in terms of material happiness and social egalitarianism. I am not reluctant to recognize the merit of success measured in such terms. But I think within Japan's success there are some problems.

Let's compare Japan and Europe. In Western Europe, industrialism and democracy were created by Europeans as modern values. At the same time I feel that, alongside industrialism and democracy, the Europeans have always maintained an attitude of skepticism. Such skepticism, I do recognize, has waned over the years. But relative to Japan and the US, I think Europeans have always had this

skepticism together with their other modern values. This skepticism expresses itself, for example, in their individualism. It has also served to accelerate the growth of industrialism and democracy.

At the same time, because of their individualism, individual Europeans have been able to establish their own little niches of livelihood around themselves. And they have steadfastly clung to their old cultural traditions. I suppose they used their skepticism to slow the destruction of old traditions in the face of rising industrialism.

But over the time, as European civilization crossed the Atlantic to the US, such skepticism waned and lost its steam. Then, as US civilization crossed the Pacific and reached Japan following World War II, such skepticism was weakened even further.

If Japan has succeeded industrially and in terms of democracy, I think such

success has, by and large, been due to the fact that Japanese have lost their sense of self-skepticism. In other words, in the 35 years since the end of the Pacific War, the process that Japan has been going through has been a sort of pure in-house breeding of our own industrial and democratic values on the basis of, at least superficially, European values.

I would not be so simplistic as to negate all this in one single stroke. But, I think, behind these modern values that have brought about material happiness and social egalitarianism, there are perhaps to be found some seeds of decadence. And there is, to some extent, a growing risk of decadence in Japanese culture today.

A second point I have is that Japan's success is believed by many outside observers to be because of unique Japanese ways of collective management. That belief has a certain amount of truth in it. But I think it is about time that we rid ourselves of such a dichotomous view of the world—that Japan runs on "collectivism" and America and Europe on individualism. We should no longer subscribe to such a simplistic dichotomy. To me, there are within Europe and America both "collectivism" and individualism, and so it is within Japan. I think any comparison should start from this basic assumption.

At the same time, Japanese individualism is slightly different from the Western individualism in that ours may be termed a "reciprocal individualism." Even though there are individuals, we always behave or conduct ourselves considering at all times the contextual relationship with other individuals. In the West, on the other hand, individualism is atomistic; that is to say, the individual always comes first, and his contextual relations with other individuals are

only secondary.

Now, in terms of collectivism, that of Japan is an open and flexible kind of collectivism where voluntary actions are always approved or permitted, as opposed to the Soviet kind of collectivism, for example, which is closed and rigid. Therefore, Japan's success is very much due to the interplay of individualism—reciprocal individualism—and flexible collectivism. And that is how we have been able to achieve material prosperity and social egalitarianism—or order.

While such individualism and collectivism may bring about cultural stability internally—and I think these factors do tend to assure such internal cultural stability—when the nation is faced with external political or military pressure, precisely because of such individualism and collectivism, we do lack fundamental strength. Because our individualism is not of the purely atomistic variety, our culture and in fact our nationhood tends to become somewhat unstable when faced with external pressures. There are numerous examples in Japan's history when we indeed have become extremely unstable in the face of external pressure. And, despite our success as measured in the terms I defined earlier, we have not been able to overcome this weakness.

Decision-Making

Wilson: I would like to carry the discussion now into the practical sphere of actual political and economic decision-making, which may bear out some of these points.

Going back to something that was said earlier about Japanese products' acceptability in foreign markets, I feel that the products themselves are in fact accepted pretty widely. The story that one used to read about the British striker going to his workplace to demonstrate against Japanese imports, which he was

told were threatening the closure of his factory, would quite happily come home afterwards in his Datsun car and watch his Hitachi television set without feeling any particular contradiction. That is perhaps to put it in rather an extreme way, but I believe there are many people throughout the world who are not really aware of the place of origin of the things they are using.

There are, of course, consumers who do have strong feeling about Japan. And it is with such people that existing prejudices and fears can be reinforced by Japanese products. Somebody mentioned earlier something about industries in the West disappearing from the face of the earth. Now that is something that would make a headline in a British paper.

I remember very distinctly going to talk to a group of people in a town in England and finding that many of them were very humiliated at the prospect, as they saw it, of having to admit that they could no longer manufacture cars that were as good as the Japanese. These are feelings that the British are forced to endure for the simple reason that they happened to pioneer so many of these things that are being passed around from one country to another and going around the world today. They feel now that, the doors being open to all, Britain became less competitive.

The British are being told by their officials that they must make more effort to exporting things like Scotch whiskey and biscuits and cloths and confectionery. These are things about which British officials spend a lot of time arguing with Japanese officials in terms of getting better access to the Japanese market.

But they are not glamorous things. They are not things that you can make work. They are rather

passive things, and a full-grown man in a modern society has no particular pride in making them perhaps, whereas a car is something that anyone can be proud of making. Scotch whiskey is really just water with a little bit of something added. That's all. There's no great merit in producing that, if the truth be told.

I speak like this to try to convey some of the emotions that are aroused by these developments in international trade and to help to explain some of the anger that attaches to Japan.

Defense Burden

Okita: We have been talking about the frictions and fears between the Japanese and the Americans and the Europeans and the others. I sense these things more strongly when I visit the European nations than I do in the US. One reason for this is probably that Europeans in general do not care for change.

A friend of mine, an economist from the United Kingdom, stated that the United Kingdom had always been a very quiet, calm nation and the quality of life enjoyed by the British was and is high. But one day the bloody Americans came into the United Kingdom as well as the bloody Japanese. And they started talking about efficiency and productivity. And, he said, "We the British are not happy about the situation." Well, he said this at least half jokingly, but maybe he was trying to tell me something.

Another point which could be termed background for the frictions is that there is criticism, especially in the US, and recently among our European friends as well, that the Japanese are enjoying a "free ride" in terms of international security arrangements.

I recall that a few years ago the Chancellor of Ex-

chequer of the United Kingdom said that the British are running with heavy armor on their backs, whereas the Japanese are running with just light shirt and that is the reason why the British are not as competitive in trade as the Japanese.

Of course, Japan is well aware that changes have taken place in the situation in the Far East as well as in our economic power. People here are beginning to say that perhaps we need a more effective defense system and to realize that we may need some increase in the defense budget. This opinion is supported by the government of Japan as well.

However, because of our basic policy of conducting self-defense, any drastic increase in our defense expenditures would give rise to doubts and suspicions on the part of other Asians. I do not feel that we will see any substantial increase in the defense budget of Japan. But at the same time, as I said earlier, I do think that Japan can play a larger role in promoting world development in terms of increasing food production, developing energy sources, and consolidating the infrastructure, especially with regard to transportation. I consider this to be a constructive role that would be most desirable for Japan to undertake.

I believe that more and more people are gradually coming to stress that Japan should be taking up such a role in order that our great economic power could be used for the world's benefit.

Japanese Model

Arndt: The Pentagon is urging Japan to make a bigger defense effort, but a lot of Americans on the street are not so sure because, while they might accept that the majority of the Japanese people now feel the way that Dr Okita

has suggested, they don't feel they can be sure that this will still be true in 10 or 15 years' time. They remember that a majority of the Germans were pacifist in the 1920s. And it's this sort of ambivalence that I think plays some part also in the thinking in Southeast Asia. It is a real dilemma which I think we all recognize.

Regarding Professor Nishibe's remarks, I accept his subtle way of saying that the dichotomy between Western individualism and Japanese collectivism is simplistic. But from the outside—and I think this applies to people in Southeast Asia as much as to Europeans—the difference or the outstanding quality of Japanese both at home and abroad is their subordination of what in the West would be regarded as individualism to traditional values of loyalty to the company and to the nation. And this, I think, is regarded by people outside both as a strength and as a weakness of the Japanese.

On the one hand, there is a lot of thinking in Southeast Asia and elsewhere in the Third World about the Japanese model. "Why can't we achieve what the Japanese achieved?" The more thoughtful people in the end say, "It is precisely this collectivism in the sense of social cohesion, this willingness to subordinate individual interest to that of the nation, that has been the major factor." It may be a part of the whole business of Confucian virtues or whatever, or it may be a part of the whole morale, where each individual Japanese, we are told, is reluctant to go home from the office before any other, lest he lose face. That may be untrue. But still there is a tendency, I think, for Japanese to feel that to demonstrate their loyalty, their sense of duty, and such feelings have more influence on the

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individual's behavior here than they have in Western countries.

At the same time this is regarded as a weakness, because it does seem to suggest to people that the Japanese will be less motivated than, say Americans for example, by pure commercial considerations. You can never depend, the Indonesians would say, on the Japanese businessman making a straight profit calculation. If all they are after is the profit of the company, as is the situation with the Americans you know where you are. With the Japanese, however, you can never be sure that they do not put what they regard, or what MITI regards, as the national interest of Japan ahead of commercial considerations. And even then you are not sure what line they are going to take.

Now, I am not sure that any of this is valid or well taken. But it does seem to me that both these views of Japanese behavior, both its strength and the weakness, are still very important outside.

Mutual Understanding

Shinohara: Professor Nishibe emphasized that Japan's success in industrialism and democracy was because these two values were achieved without being accompanied by European-style skepticism. But I feel that in Japan's case there was, in the place of skepticism, a set of traditional values that helped our growth and development and our success in democracy and industrialism. Only because modern values were coupled in Japan with traditional values have we been able to support the very rapid economic growth that started in early Meiji era and has continued, particularly in the postwar years. In fact these two types of values, the externally acquired values of de-

mocracy and industrialism and the indigenous traditional values, formed the two wheels of the cart supporting the very rapid growth of Japan.

In our future dealing with many nations, including many neighbor-nations of Asia, there must be more mutual understanding than ever before. We must get really to know the individual characteristics of each nation. This will be an especially important factor affecting our economic access to these countries. As we make economic overtures to these countries, I think we have to think in terms of cultural contacts, otherwise frictions and tension will inevitably arise. There must be enhanced mutual understanding if we are to avoid these frictions.

I see the future role of Japan as significant not merely in the energy, defense or economic field, but also as equally—or perhaps even more significant in rendering a sympathetic ear to the varieties of views and values of various nations.

Many Similarities

Okita: There have been many books written recently which emphasize the differences between Japan and the West. But today I think there are more similarities than differences. And I fear that overemphasizing differences is a wrong and misleading approach.

The major difference is the difference in the relative stages of development. Japan is a relatively young, capitalistic society. Twenty years from now there will be even more similarities between Japan and the West than there are today. Even though there remain many uniquely Japanese features, they are only of partial influence. They are not dominant today.

(Concluded)

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SCIENCE AND TECHNOLOGY

ELECTRONICS ,COMPUTER INDUSTRIES' FY82 PLANT ,EQUIPMENT INVESTMENT REPORTED

Tokyo DENPA SHIMBUN in Japanese 3 Mar 82 p 1

[Text] Emphasis on Semiconductor/IC

The FY-82 plant and equipment investment schedules of major electronics and computer manufacturers demonstrate a continued offensive stance. The total combined budget for Hitachi, Ltd and five other firms is approximately 415 billion yen--a double digit (14-15 percent) increase over the previous fiscal year amount. The enlargement of the semiconductor/IC related field remains significant. In the computer related category, an expansion and repletion plan in keeping with a quantitative increase is expected. In order to effect increased production of peripherals and terminal equipment accompanying the expansion of OA related machines, the transfer of production items to other plants and factory "relay out" are expected.

Increased Production of OA Terminals

Hitachi, Ltd will go to a 100-billion-yen budget in the FY-82 plant and equipment investment schedule. The firm will directly invest in strategically important departments. The expanded schedule calls for investment of half the amount quoted above (50 billion yen) in IC/electronics fields. Nippon Electric Company, Ltd will put in 95 billion yen and Fujitsu, Ltd, 75 billion yen. The budgets of the three firms together make up 65 percent of the six-firm investment schedule figure total.

Oki Electric Very Enthusiastic About IC

In terms of plant and equipment investment according to different categories, Oki Electric's IC Department designation of slightly under 60 percent of the total budget for the semiconductor/IC field is noteworthy. Other firms are putting 30 to 40 percent of their respective budgets into this sector. As in the previous fiscal year, the firms regard this category as the most important.

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Likewise, as a result of the LSI trend, the plant and equipment investment in the computer category is more than ever shifting toward the magnetic disc, printer and other peripheral and terminal equipment fields; and there is a strong tendency to beef up the software department.

At Hitachi, of the FY-82 budget of 82 billion yen, the electronics category which includes IC was allotted 34.4 billion yen; and of this amount, the IC related field is expected to receive 28 billion yen. When we include the five related firms in our consideration, the total IC related allocation comes to 36 billion yen.

46-Billion-Yen Total for Affiliate Firms

Thirty-five billion yen are slated for the semi-conductor/IC category in FY-82, and the scheduled size of the investment in this sector for the five affiliate firms as well as Hitachi is slated to be a total of 46 billion yen.

In the computer related category, the Kanagawa plant (99,000 square meters) which manufactures mainframes, is operating at just about full capacity; thus, its expansion must be considered. But the Odawara plant (75,000 square meters), which deals in input/output equipment and outside memory facilities, and the Asahi plant, which handles minicomputers and office computers, are said to have some reserves, and there are no plans to expand these facilities.

10 Billion Yen for Computer Category

Nippon Electric Company (NEC) FY-82 budget was 85 billion yen. Of this amount, the semiconductor/IC category captured nearly half (41 billion yen) the total amount. Its computer allotment in the meantime has reached 10 billion yen.

This firm has transferred a segment of the Fuchu plant's magnetic disc section and office computer production to the Ibaragi Nichiden plant, which was completed toward the end of last year. It has started construction of a secondary-phase plant with the same dimensions as the first-phase plant and is working on a plan to make the former into a mass production computer factory.

In April 1982, Niigata Nichiden, which has increased its production lines, will start producing OA Terminal 5200 Model 05, in addition to printer production.

Thus, in the computer related field, NEC's task allotment is as follows:
Fuchu--mainframe, minicomputer; Ibaragi--office computer, magnetic disc;
Niigata--printer, OA terminal; Tohoku Nichiden--printer, crossbar switchboard;
Shizuoka--printer, FAX.

Mita, Sagami-hara, and Mizo-no-guchi's electronic switchboard, PBX are slated to be transferred to the Gamago plant, scheduled for completion in October. The communications/computer related production format will be expanded and strengthened significantly. The FY-82 budget of 95 billion yen, too, will have IC as its focal center.

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Totobayashi Plant's Construction To Start

Fujitsu's FY-82 budget to 59 billion yen will have an IC related allocation of 33-34 billion yen. In the case of this firm, the expansion of the OA, peripheral and terminal facility sections is noteworthy. It will begin construction of the Kanbayashi plant with a view to making it an OA factory. This is due to the fact that the Minami-Tama plant--which is producing the Japanese WP, financial terminal, printer--has reached its maximum production capacity. The magnetic equipment will be transferred to the Kumatani plant (13,000 square meters) scheduled for completion in June. It is examining the possibility of establishing magnetic equipment production at the Yamagata plant and a personal computer related equipment factory at the Yamagata plant and a personal computer related equipment factory at the Miyagi plant within the year.

After the transfer of its M-series production to Numazu, the Nagano plant is now the production base for the V-series, print baseboards and magnetic disc related parts.

Expansion of Software Development

Mitsubishi Electric Corporation's FY-82 budget was 45 billion yen, whereas for FY-82, an allocation of about 50 billion yen is predicted. As in FY-81 (electronics related allocation--23 billion yen), half this amount is expected to be invested in the electronics category.

In the computer related field, the firm poured 2 billion yen into the Kamakura computer manufacturing plant in 1981 in order to build a 10,000-square-meter building. In addition, it is enlarging the software development section and is expanding the peripherals and terminals as well as pathologic computer production lines.

Toshiba's FY-81 budget was 67 billion yen. In 1982, it plans to effect a 6-percent increase of the construction base. During FY-81, it expended 22 billion yen in the semiconductor/electronics parts field (20 billion yen in IC alone) and 8.6 billion yen for the OA, computer related categories. This amount is slated for expansion of the Hino plant (FAX) and construction of a new peripherals factory in Oume.

Personal Computer Production To Be Strengthened

As shown above, the main thrust of plant and equipment investment is the IC section; but in the computer related field, it is expected that the FY-82 plant and equipment investment schedule will continue to uphold the emphasis shift to the expansion of personal computer, OA equipment, peripherals and terminals.

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SCIENCE AND TECHNOLOGY

CURRENT R&D OF CERAMIC ENGINE, STIRLING ENGINE DISCUSSED

Tokyo SHUKAN TOYO KEIZAI in Japanese 13 Feb 82 pp 78-84

[Article by Yasunobu Otori, science commentator: "New World Unfolded by the Application of Ceramics"]

[Excerpts] Late last year an automobile powered by the world's first ceramic diesel engine was tested at the Ceramics Consolidated Research Laboratory of Kyoto Ceramics located at Kokubu city, Kagoshima Prefecture, and caught the attention of the world.

Speaking of ceramics, they are not the ordinary kind of ceramics. They are the fine ceramics (FC) which were developed very rapidly in recent years and are known for their superior heat resistance, wear resistance and mechanical strength. The cylinder as well as the piston of this engine were made of FC. Ceramic development and engine design were started several years ago by Kyoto Ceramics with the cooperation of Isuzu Motors. This engine, which has three cylinders and a capacity of 2,000 cc, is of practical size.

Although the people of Kyoto Ceramics modestly stated that "We just proved it could be done with today's technology," it was no less than a precursor of the "ceramic engine revolution" which may fundamentally change the present low thermal efficiency metal engine.

An Engine Which Does Not Need Cooling

Although still in the experimental stage, its epoch-making character is quite evident from the three cylinders which stand erect like short chimneys. The conventional metal engine has cylinders surrounded by the water cooling system so the cylinders are invisible, and there are also many attachments including a radiator.

The ceramic engine has none of these because it does not need cooling. Naturally, the gas temperature inside the cylinder will be much higher and thermal efficiency will be improved. About 30 percent of the heat which would otherwise be lost through the cooling water can be saved. If energy in the high-temperature exhaust gas is recovered by means of a turbocharger or something else, engine efficiency can be raised 15-20 percent over that of a metal engine.

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Reduction in weight due to the elimination of the cooling system superimposed on the reduction in weight due to small size and light weight afforded by an improved efficiency have a secondary effect on the improvement of efficiency. Starting from the revolution of the engine, the revolution of automobiles will take a new turn. The leading role in this revolution is played by none other than the FC itself.

Ceramics That Can Withstand High Temperature

Now then, how do people of Kyoto Ceramics who have successfully made a trial run of an FC engine appraise it and what course of action will they take concerning its practical application?

"In the field of electronic ceramics production, Japan takes pride in its world dominant position in advanced technology, as well as in the actual results of its application. The outstanding features of FC include high strength at high temperatures for which metals parts are useless, so FC can be utilized for manufacturing parts exposed to high temperature and severe mechanical conditions such as an automobile engine," said Kazuo Inamori, president of Kyoto Ceramics. He continued, saying: "Metals are not only susceptible to oxidation at high temperature, but also the best heat-resistant alloy with superior high temperature strength begins to lose its strength at approximately 600°C and becomes soft and malleable. They can hardly support any load at a temperature greater than 1,000°C.

"Ceramics are not easily oxidized and there are also some materials which will not soften at all at a temperature as high as 1,500°C, at which most metals would melt. Therefore, if an engine that does not need cooling can be made from ceramics, a revolutionary increase in thermal efficiency can be achieved (heat loss through the cooling medium accounts for 30 percent of all heat losses).

"However, engine parts are subjected to severe and repeated stresses. Therefore, if the parts (including cylinders and pistons) made of hard and brittle materials such as ceramics were to be used in mass produced engines, an extraordinary effort would have to be made to insure their reliability.

"Nondestructive inspection technology applicable to the parts with complicated shapes, such as pistons and rotors made of ceramic, has not yet been established. Therefore, there is urgent need to develop an inspection technology of sufficiently high accuracy which is also applicable to the management of a mass-production process in the future.

"The problems that must be solved by ceramics makers include, for example, increasing the strength of the products which are mass-produced; minimizing the variation in the quality; and manufacturing them efficiently in desired shapes and sizes with the necessary accuracy.

"As to the means of increasing strength, in addition to strict quality control during the manufacturing process, strengthening through special processes can also be considered.

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"As to machining precision, only diamond tools can be used for machining FC products because of their hardness. However, because of this hardness, surface slack and elastic deformation during the machining process will be reduced. FC products therefore ought to be manufactured to high machining precision with efficiency if the appropriate tools and cutting conditions are used."

Target items for development considered by Kyoto Ceramics include the following: automotive diesel engines, gas turbines used in power generation, rotors, ball bearings, and such important parts as spindles used on ultraprecision machine-tools, tubes used in high temperature heat exchanger, and the interior walls of a nuclear fusion furnace (to withstand a temperature as high as 1,800°C). These are all related to the use of FC to improve energy conservation, heat-resistance and durability.

The importance of developing an automotive diesel engine (2,000 cc class) using FC of the silicion nitride family, the favorite of all ceramics, was recognized by MITI, and an important technology development subsidy amounting to 120 million yen was given 3 years ago to Kyoto Ceramics. The trial production of an FC engine has been completed. Based on the achievements of the past 3 years' development, a 4-year plan consisting of second-stage applications research activities was launched in 1981.

At the same time, with the cooperation of Isuzu Motors, Kyoto Ceramics will continue research on the improvement of engine design, the development of production technology and measures to bring down costs.

That is, during the next 4 years, the quality of FC will be further improved; an engine capable of fully utilizing the best features of FC will be designed and developed, the number of parts will be reduced significantly to achieve the reduction in weight, the reduction in size, energy savings and the low costs so that an FC engine may become practical. This engine is expected to be a four-cylinder, 2,000 cc one.

Toyota and Nissan Will Also Tackle the Problem

Although Kyoto Ceramics was the first to conduct a trial run with an FC engine, it was not the first to undertake the development of an FC engine.

For example, Toyota's Central Research Laboratory 17 years ago in 1965 began its research activities with the conviction that ceramics was the only material satisfactory for the future engine.

They have developed their own FC of silicion nitride family sintered at 1,750°C and found that its strength at 1,200°C was 100 kg/mm². The fact that this ceramic was manufactured under normal pressure was judged a favorable condition for the mass-production of the engine.

As to the prospect of engine development, a trial car with a diesel engine will be produced by 1985 and practical application will be realized in the 1980's. An experimental car as well as a practical car powered by gas turbine will be delayed until the 1990's.

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On the other hand, at the Nissan Motors Central Research Laboratory, work on FC engine parts is also underway. They consider it quite possible to run an experimental FC car by 1985, but when it comes to mass-production of these engines, they feel that there are still many problems. Practical application of an FC gas turbine, still in an unknown domain, is also considered an event for the 1990's or later.

Toshiba, one of the FC material makers, has successfully synthesized a silicon nitride powder of high quality. The ultrafine particles of this powder have an average diameter in the range of 0.5-1 micron and excellent sintering properties. FC made of this powder are said to have the strength of 126 kg/mm² at 1,200°C.

With the cooperation of an automaker, Toshiba is expected to produce a practical FC diesel engine by the latter half of the 1980's.

But what's going on overseas? In West Germany, Daimler Benz is quite active. They have been doing the R&D of a FC diesel engine and made public last year a gas turbine passenger car, "Auto 2000," which uses an FC rotor.

Fuel consumption has come close to a practical level, but the technology to mass produce FC parts has not yet been developed. They have recorded the operation of an FC rotor at 60,000 RPM at 1,250°C.

Volkswagen, too, is exerting efforts to develop FC engine parts. Porsche has not tackled the problem in earnest yet, but is expected to have a share of the ceramic engine in a long run. BMW considers that it will take a longer period to realize mass production of ceramic engines, definitely not within the next 10 years.

MITI Too Takes Action

MITI also recognized and attached importance to Japan's tardiness in this field. It took positive action to include FC, starting in 1981, as part of the "R&D system of basic technologies for the industry of the next generation," and to cultivate and strengthen FC research.

In the wake of the "FC round-table conference" organized in late 1980 by the Advanced Machine Tool Technology Promotion Society and nine firms, including Kyoto Ceramics and Toshiba, an "FC Technology Research Association" was organized last August under the auspices of MITI with the following 15 firms joining the association: Kyoto Ceramics, Toshiba, NGK Insulators, NGK Spark Plug, Showa Denko, Sumitomo Electric Industries, the Electro Chemical Industrial Co., Shinagawa Fire Brick, Kurozaki Yogyo, Kobe Steel, Inoue Japax Laboratory, Ishikawajima-Harima Heavy Industries, Toyota Machine Works and Toyota Motors.

This project is allocated a budget of 13 billion yen for 10 years. It is centered or entrusting development to companies and adopts a competitive development format. Its aim is to catch up with and surpass the level of the United States. With enterprises such as Kyoto Ceramics, which has been

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exporting stationary blade parts used on FC turbines to GM and Ford for 2 years, as an association member, they expect to be able to catch up with the United States in engines within 5-6 years.

Stirling Engine That Will Shoulder the Next Generation

In Japan, the development of an automotive stirling engine (SE) is being undertaken not only by automakers such as Toyota and Nissan but has also been undertaken by the Institute for Technical Research in Machinery and the Agency for Industrial Science and Technology in the area of basic research for the past 5 years.

This institute recently constructed an experimental SE (MELSE II) and obtained 1.88 horsepower of output with an average operating gas pressure of 33 atmospheres. The operating gas was helium and the shaft speed was 500-1,500 RPM. Although the output in power was less than expected, they were satisfied with the fact that a foothold for the future progress had been secured.

High Energy Utilization Rate

Japan's interest in SE leads the world because SE can provide Japan with marine engines for which high efficiency is of the utmost importance from a consideration of the fuel consumption during a voyage, having ample margin in the engine installation as well as a favorable specific output. The Transportation Technology Council, which is an advisory organ to the minister of transport, in July 1975 gave a go-ahead for the development of SE. With the cooperation of the Institute for Technical Research of Ships and the Japan Naval Architectural Research Association, the Ministry of Transport entrusted the tasks to the following three firms: Daihatsu Diesel, Mitsubishi Heavy Industries, and Nippon Piston Ring, and had them develop a domestic marine SE by 1980.

Since there are many ships in the 1,000-ton class, goals for development were set up with these ships in mind: output horsepower: 800; speed: 720 RPM; fuel: heavy oil; working medium: helium or hydrogen; and efficiency: 36-40 percent.

As a result of this undertaking, a new sealing technology to prevent gas leaks was developed by Nippon Piston Ring. The targeted SE was actually trial manufactured and tested by Daihatsu Diesel. Although the expected output was not achieved, the test confirmed that the development goals set at the beginning were all achievable.

The expectation of the energy industry circles about the SE is also very big. Tokyo Gas and Osaka Gas are taking upon themselves the tasks of developing SE as part of a household total energy system.

With the cooperation of Aisin Seiki Co and Mr Yoshihiro Ishizaki, ex-lecturer, Faculty of Engineering, Tokyo University, Tokyo Gas made a small-scale SE for power generation on an experimental basis several years ago. The idea was to generate power by each individual household with the exhaust heat to be used for space heating and hot water heating. Economy and no noise were the

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attractive features of SE. Aisin Seiki is currently engaged in the development of an SE with 50 kw output.

Mitsubishi Electric too appraises highly the SE which is characterized by low noise, no pollution, high efficiency and multiple fuels. According to their estimate, a high efficiency system having an energy utilization rate of more than 150 percent (the ratio between the energy obtained by air-conditioning and hot water and the total energy spent in the form of fuel and auxiliary electric power) can be realized to form a combination between household air-conditioning (both heating and cooling) and hot water heating which use a heat pump powered by an SE. They are forging ahead with the development of a household SE with an aim to put it to practical use in 3 years.

The SE has thus progressed from the industrial application stage to the household application stage. However, its development in Japan is still far behind that of the United States and other countries. MITI has designated the development of the SE as a link in the Moonlight Project, and will invest 10 million yen over a period of 6 years starting in 1982.

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SCIENCE AND TECHNOLOGY

FUTURE OF JAPANESE BIOTECHNOLOGY INDUSTRY DISCUSSED

Tokyo USHIO in Japanese Mar 82 pp 112-128

[Article by reporter Teruaki Fukami]

[Excerpts] Japanese Genetic Industry Aims for World Supremacy

First Year of Practical Application of Genetic Engineering

"From spring through summer of last year, there was a sense of a big boom in genetic engineering, but it was due to the presumptuous mass media and its overplaying. The real practical application actually starts this spring. So 1982 is the first year in the practical application of genetic engineering."

A research staff of a certain think tank stated this decisively while chiding the mass media.

Naturally, there is some foundation for the statement.

The guidelines (recombinant DNA experiment guidelines) were established in Japan in 1979. In other words, it has been fully 3 years since the simultaneous start with "Ready, get set, go." It is finally taking off from basic research and is now about to step into the second round of practical application.

It has entered into a period of clinical trials of pharmaceuticals prepared by genetic engineering.

The first trials began at the end of last year. Clinical trials of insulin (effective drug for diabetes; distributed by Shionogi Seiyaku) prepared using E. coli are being conducted by Professor A. Ebihara of the Jiji Idai [Medical College] and others.

Next, at about the time this magazine is published, clinical trials on a growth hormone (drug specific for dwarfism; distributed by Sumitomo Chemical) prepared by the same technique as above will have been started by Professor K. Shizume and others of the Tokyo Women's Medical College.

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And, the third bullet! Interferon (believed to be a specific drug for cancer and viral diseases; distributed by Takeda Chemical), which has now become symbolic of genetic engineering, will be added to the clinical trials starting about March. Thus, there will actually be opening fire in the "war of new genetic engineering drugs."

However, the new drugs of these three firms are all imported from European and American countries.

Compared to the United States, which is leading, the level of Japanese genetic engineering is said to be 4 to 5 years behind.

However, the recent genetic engineering fever in Japanese industrial circles is something to behold. One and a half years ago, when I began reporting on the subject, the number of firms participating in genetic engineering research was only a little less than 20. Now the number easily exceeds 100, and the fact that it appears that "no firms can be successful without genetic engineering" calls for nothing less than amazement.

Just to mention a few, they include Sapporo Breweries, Asahi Breweries, Nippon Oil Co, Snow Brand Milk Products, Calpis Food, Mitsubishi Petrochemical, Nippon Paint, Chisso Corp, Teijin, Asahi Chemical, Jujo Paper, etc. Among them are a fair number of firms that seemingly have no connection with genes or biology whatsoever.

There is an enormous number of firms venturing into the field of pharmaceuticals using biotechnology (biological engineering as a whole, including genetic engineering) as the lever. According to the results of a questionnaire survey conducted by Nihon Keizai Shimbunsha last year concerning "plans for business in biotechnology," 44 percent of the 95 firms having such plans replied that pharmaceuticals was the target.

Among them, the most remarkable transformation is found in textile manufacturers and petrochemical manufacturers. In both cases, they are betting the companies' fortunes to get out of textiles and petrochemicals which are at the bottom of the structurally depressed industries. We can understand that much. However, what will happen when most of the enterprises venture into pharmaceuticals in a similar fashion?

Projects in Development Are Top Secret

Sumitomo Chemical is the major chemicals manufacturer next to Mitsubishi Chemical, and it is already vying for the first and second positions in synthetic pharmaceutical technology. Although it was slow to start, it says the biotechnology structure is finally in order.

"To be honest, we were weak in the fermentation field, and to cultivate that technology, we imported interferon cell culture technology from Wellcome Co (British). We also intend to produce antibiotics ahead of others. We will compete in the future with antibiotics, interferon and

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later with genetic engineering drugs. We would like somehow to bring the level up to that of the exclusive drug manufacturers.

"A long-term plan is to reduce the widely used petrochemical products as much as possible and to steer toward leading technology using genetic engineering along with other biotechnology and highly functional substances as the backbone. However, we still produce aluminum, which is a big job. But then, we didn't have to think about all this before the oil shock...." (Sumitomo Chemical)

Asahi Chemical, which is now more fit to be called an "everything manufacturer" rather than a synthetic fibers enterprise, built and staffed a P3 experimental laboratory last October at the technical research and development laboratory in Fuji (their central laboratory, with a staff of 250).

"We had fermentation and synthesis technology, and it was a natural consequence to go into genetic engineering. For the time being, we are advancing the technological power aiming at pharmaceuticals and agricultural chemicals in 5 years. In the 21st century, chemical plants will probably be replaced by biological plants, and the cultivated technology will then become useful." (Asahi Chemical)

A chemical manufacturer, Showa Denko, says it has set its sights on drugs for the circulatory system among the pharmaceuticals. "Because of the broad area of biotechnology, the means to narrow the aim is a cardinal point. Otherwise, it will only eat up money without bearing fruit.

"Only in Japan are exclusive drug manufacturers developing pharmaceuticals. In West Germany and the United States, it is done mostly by chemical manufacturers. The development of large-scale pharmaceuticals is growing technically more sophisticated each year, and it is getting to be difficult without the force of a general chemical manufacturer." (Showa Denko)

While reporting on these firms, one headache that I encountered everywhere was a scene that was equally irritating. It was met when I asked the question: "What sort of genetic engineering projects are you engaged in?"

People who had been talkative until then become admirably close-mouthed after that.

A certain research staff member explained apologetically:

"It is estimated that the 'time and expense' required for a new drug to appear on the market is '10 years and 3 billion yen.' Moreover, the success rate of development is 'one in a thousand,' and even with those brought to clinical trials, the ratio is 'one in ten.' You see how difficult it is. Therefore, the development of a new drug is a top corporate secret. The bigger the scale, the more completely we must prevent the leakage of information."

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A development manager of another pharmaceutical manufacturer added to the above statement, saying:

"This is particularly true with genetic engineering. When this technique is used, I can go so far as to say limitless mass production is possible. Therefore, if you get there first, one firm can conquer the world market. As a matter of fact, 10 grams of growth hormone is enough for the entire world. Moreover, the cost is absurdly low. This is attractive. Consequently, a firm will never say what its targets are."

Depending on the enterprise, some firms will refuse to disclose not only the number of research staff or R & D expenditure, but even the location of the research laboratory.

A publicity section chief of a food product firm who said "reporting on a research staff is out all the way," explained:

"For our company, biotechnology is a business of life and death in the future. Even if we publicly announced the slightest part of our research structure, it would reveal roughly what we are doing and on what scale. Even if the research staff talks cautiously, one can guess the substance from a slip of the tongue now and then. Please excuse us."

I felt indeed that I was getting a glimpse of a frightening world as in a spy novel.

At any rate, although we don't know what they are doing much at all, the firms venturing into the pharmaceutical area using biotechnology as a lever are many indeed.

Strategies of Suntory and Yakuruto

The first to call out was an unknown, middle-of-the-road pharmaceutical manufacturer, Wakinaçı Yakuhin. It succeeded in the synthesis of secretin, a drug specific for gastroduodenal ulcers.

It was Suntory that competed with Wakinaga for the first, the synthesis of secretin.

It succeeded in manufacturing alpha-neoendorphin, an analgesic resembling morphine, using E. coli and yeast.

Suntory produced the result within only a year after the start of research and development. The secret? Managing director T. Noguchi said nonchalantly:

"Because we started at the tail end of the new drug war, we gathered researchers who were at the foremost level in the world. Therefore, the world's top technology came in smoothly. In addition, since a system has been established beginning with a project setup, design and preparation, something is produced in an average of 3 to 4 months. I am strict,

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and I give strict orders for completion by a certain date. Research and development is systematic engineering. It is no good even if a certain portion or a certain person is outstanding unless the overall level moves in accord. The key is whether or not the research organ moves smoothly like a human body."

It was also unexpected when Yakuruto appeared with an enzyme called staphylokinase that lyses thrombi that can cause cerebral thrombosis or myocardial infarction.

Although there are 90 research and 50 assistant research staff members at the central research laboratory in Kunitachi, Tokyo, the genetic engineering group has only a staff of 5, compared with 18 at Wakinaga and 33 at Suntory. The Yakuruto research staff has proven physically that research in genetic engineering can be competitive even with a small staff.

The managing director in charge of the central research laboratory, Y. Sumihara, cited the company's background as its driving force.

"We were familiar with the techniques of handling microorganisms such as lactobacillus and bifidobacterium as well as enzymic reactions (we first developed an enzyme that strips plant cells), in the course of elucidating their functions medically, the way to new drug development opened up."

In other words, he is saying that genetic engineering existed in the course of development of the microbiological (fermentation) industry and enzyme industry. This was the same in the case of Suntory.

In fact, this is the very reason that Japanese firms having potential in the traditional fermentation industry of bean paste, soy sauce, fermented beans, rice wine, etc., are looked on as a threat by European and American firms although they are lagging behind in genetic engineering.

The reason is that even though a substance is produced by freely using genetic engineering with E. coli, the bacteria must be cultured in a tank in the final industrial step, and the knowhow of the fermentation industry is useful then.

Conversely, this is the reason why fermentation businesses all joined in genetic engineering.

In addition, a research staff member at the central research laboratory, N. Sakurai, pointed out the importance of a "genetic engineering strategy." "The problem is what to produce. The pharmaceutical field is very difficult since many firms are competing. One may say interferon is good, but there is no room to get in any longer. One cannot compete without due consideration for these matters, and one must look for something unique.

"Then, we had the idea to extract something from a group of pathogenic bacteria. Although pathogenic bacteria produce toxins, they also have good properties as well. One needs to extract only the good properties by using gene splicing."

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Appearance of "Star Performer" Mitsubishi Chemical

Now, will these domestic products actually be successful as a medicine? "There is a good possibility if the demand for secretin grows in the future." (Wakinaga) "It may reach the reagent level for basic research, but drug preparation must be carefully considered." (Suntory) "More research is necessary." (Yakuruto) Thus, none of them shows much enthusiasm.

Judging from the fact that Wakinaga and Suntory among the above three firms do not try to hide the fact that "the prospective winner among new drugs is interferon," we may consider that the three substances they succeeded in producing are "small grains" as drugs.

However small they may be, it is still significant that the genetic engineering began trotting prior to its jump into practical application with a target within only a few years.

Furthermore, a motion to accelerate that trotting has developed at this stage. It is said that the intense silence of the star enterprise which has been maintained until now will be finally broken this spring.

The first to start the fire is likely to be Mitsubishi Chemical, which is dubbed the bioindustry's number one blue chip. The president declared: "We shall announce our achievements by spring."

Two years ago, the director of the Life Science Research Institute was switched from an academic, F. Egami, to industrialist, M. Niwa, in an attempt to convert the previous ivory tower to a practical tower. It seems that that effort has borne fruit all at once.

Kikkoman, which went into life science earlier than Mitsubishi Chemical, has also stated confidently: "We will announce our research results at the International Congress on Industrial Microbiology and Genetics in June and ask for a judgment on the true value of our company."

Kikkoman has the Noda Sangyo Science Laboratory and the central research laboratory, and the research staff in genetic engineering numbers 50. It has a long history of enzyme research and has developed an enzyme (pectoliase [phonetic] Y23) to strip the cell wall for plant cell fusion for the first time. This is the only enzyme in the world that is applicable for gramineae and leguminosae plants, and it is speculated that it will become a weapon in the seedling industry which has a future prospect. In genetic engineering, it has been conducting sufficient basic research, as in the case of the Mitsubishi Chemical Life Science Research Laboratory, and it has been the focus of attention.

According to an informed source in the stock exchange, it appears that announcements are forthcoming from Kyowa Hakko, which has the top-level fermentation technology in the world, and Meiji Seika, which is the leading antibiotics manufacturer. He expressed these movements by stating that "Last year was the curtainraiser, and this year the star performers will finally appear."

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Japanese Firms Were Slow To Start

The present lag in Japan was naturally caused at the beginning. Was Japan an "isolated island of information" cut off from the rest of the world at the time?" Of course not.

The first to pay attention to this innovative technique in Japanese industry was M. Niwa (currently the director of the Life Science Research Institute), who was then director of the general research institute of Mitsubishi Chemical. Niwa recalls:

"As I was perusing literature and reports at that time, the possibility of chemically manipulating genes began to be discussed excitedly. I thought if that became a reality, it would cause ripple effects in various areas and it would be necessary to start following the reports."

Niwa graduated from the Faculty of Science, Tokyo University. Since joining the firm, he has been engaged in the research and development of industrial catalysts throughout. Thus, he is one of those who observed the history of Japanese high growth from its core through the progress in catalysts → growth of the chemical industry → and Japan's development. At the time, because of his position as director, he was studying broad areas of research in general and he stumbled on genes.

What is gene splicing? What technology is required for it? What impact does that technology have on the chemical industry? Wishing to solve these questions that came up one after another at the earliest possible time, he ordered his subordinates to begin investigation immediately.

Niwa was attracted by the fact that the possibility of manufacturing various new drugs was being hinted at on one side, and the appearance of a "dream industry" that would change the existing chemical industry altogether was being talked about as if it were a story in a dream.

However, the working personnel denied the possibility of application, stating: "It is technically too difficult for us to handle."

In addition to technical difficulty, what held Niwa back from starting research was the talk of risk that this technology might produce a Frankenstein. The investigation began to tail off.

In this respect, the major pharmaceutical manufacturer, Takeda Chemical Industries, also followed a similar track.

The director of the Biological Research Institute, Y. Sugino, had been analyzing viral carcinogenic genes, and in that respect, he had been working on the preliminary step to gene splicing as a natural course from early on. About that time, he had the opportunity to attend an international conference in the United States. His amazement was apparent.

"I felt that the time difference between the research of Japan and that of the United States was great, although jets are flying back and forth. In

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Japan, we were thinking that research in gene splicing had just been set afire there, but the fire was in fact burning with a big flame."

As soon as he returned, Sugino hurried with the technical research. Among the Japanese firms, his was the first to introduce the technique.

However, as in the case of Mitsubishi Chemical, the "shadowy part" of gene splicing slowed down their steps. Sugino stated the following with a strained smile.

"The Japanese are a farming race after all. Our nature is to plant one's own crop after finding out what one's neighbor's crop is. So, there won't be a Swanson in Japan even now. We have no man of ambition who heads for a gold rush with a burden of risk. As a consequence, we inevitably take the secondary means as a natural course."

These manufacturers representing the Japanese chemical industry and pharmaceuticals both saw the dawn of genetic engineering, yet merely stood looking at the situation. One may say that it symbolizes the behavioral mode of Japanese enterprises toward research and development.

The time when Japanese firms finally began to take action came only after the American venture businesses had raised their flags (1977).

Dream Industry of 8 Trillion Yen

On 13 November 1980, NIHON KEIZAI SHIMBUN carried an exclusive article reporting that "using genetic engineering, Ajinomoto has succeeded in producing a pure amino acid for the first time in the world."

Ajinomoto is the world's biggest general amino acid manufacturer, which industrialized "the taste of kelp" 70 years ago for the first time in the world. It was reported at one time by the British ECONOMIST as monopolizing the world market in amino acids (\$1.7 billion) along with its rival, Kyowa Hakko.

Its success was epoch-making in the following two aspects.

One aspect is that the application of the food industry made its way for the first time into the field of genetic engineering, which had been the focus of pharmaceuticals alone up to that time. Another aspect is that it opened the way for application in general manufacturing of "kilogram units" from the level of "milligram unit" "mass production" as in insulin and interferon. Without making a display of its novelty by manufacturing new products, it concentrated on furthering the technical innovation of its specialty.

Come to think of it, the chief of the Life Science Laboratory of Mitsubishi Chemical, W. Yamatani, said some time ago:

"Practical application of genetic engineering actually can be achieved the quickest in the chemical industry. I would expect the first products to

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appear within several years. Moreover, this will be more advantageous for enterprises than anything else."

I considered the statement surprising at the time. However, I can now see convincing elements.

New drugs are difficult to pull through after clinical trials begin; it is said that approximately 7 years are required before they appear as products. Moreover, being a new drug prepared by gene splicing for the first time in history, the National Council of Pharmacy must inevitably act with caution. Consequently, the first new drug by genetic engineering is expected to appear only after 1985 any way you look at it.

On the other hand, when introducing this technique in the production process, stringent investigations or procedures such as those required for pharmaceuticals are not necessary. In addition, the modification of bacteria to obtain increased yields of existing substances, and not to create some new substances, is an extension of creating modified strains by radiation or ultraviolet rays, and this is said to be the most advantageous use of genetic engineering.

Yamatani also stated:

"Actually, in the United States, construction has begun of an alcohol fermentation plant using microorganisms created by recombinant DNA."

The immensity of the application in the chemical industry finally became evident when I heard the figure for the market forecast for genetic engineering industry from the manager of the technical department of Mitsui & Co, K. Kawashima:

"There are various surveys as to how big a market genetic engineering will grow to in the future, and no straightforward answer exists. However, the figures thought to be the most realistic among them are growth figures of 64 trillion yen in the world in 1990, and an 8-trillion-yen industry in Japan. These figures exclude agricultural and food areas. Since the current market scale of these areas is approximately 25 trillion yen, about 30 percent will be taken by genetic engineering.

The breakdown is 6 trillion yen for the chemical industry including the fermentation industry, 500 billion yen for the amino acid industry, 500 billion yen for antibiotics, 1 trillion yen for proteins, and 200 to 300 trillion yen for hormones."

Mitsui & Co had an eye on genetic engineering rather early for a trading firm. It says it had contact with Swanson of Genentech, who is now a flagbearer of genetic engineering, even before his fame.

Why were they able to have such contact ahead of other firms?

"It is because Mitsui had a predisposition that enabled it to catch up with leading technologies. Some 20 years ago, then President T. Minakami

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repeatedly said that the important factor for a future economic society to achieve large growth was only technical innovation. Therefore, trading firms should also have their antennas up at all times for the movement of leading technologies and not merely move merchandise from left to right.

"Consequently, we are able to get to the heart of various firms. Information from all over the world comes to me regarding what manufacturers are aiming for what. We coordinate that information to successfully make transactions." (Kawashima)

The survey data cited by Kawashima above were selected accurately from among the enormous amount of information by freely using the surveying power of the trading firm, and they may be judged as having a fair amount of reliability.

At any rate, a figure of 6 trillion yen for the chemical industry is amazing. It is big enough to dim the market scale of pharmaceuticals, which in itself is not small by any means.

Bullish Amino Acids, Chemical Industry Circle

Then, what is the "genetic engineering industry" or a "genetic engineering plant" in which genetic engineering is applied to the chemical industry? How revolutionary is it? Before discussing that, I shall touch on the current state of the amino acid industry, which may be regarded as having "the bridging role" between the pharmaceutical and chemical industries.

Regarding the previously mentioned success of Ajinomoto, due to the fact that "although the substance has good purity, its productivity is not high enough to replace the conventional fermentation method," President K. Utada is said to be urging the research group to "perfect the process in 3 or 4 years."

Why did Ajinomoto put that much effort into technical innovation in the amino acid industry?

"You will understand why if you look at the history of technical competition," said a journalist who is well-informed in biotechnology.

"In this world, unless you are making constant technical innovations, you end up being left behind miserably as the remains of a previous era, like American iron manufacturers. Ajinomoto understands that very well because it has a history of such a bitter past experience."

In 1956, Kyowa Hakko succeeded in the glutamic acid fermentation process by using microorganisms for the first time in the world, and this shook the "amino acid throne" of Ajinomoto, which it had maintained since the Meiji era. This process has a productivity much greater than the conventional process. It put Ajinomoto 2 years behind Kyowa Hakko in converting to this fermentation process.

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Such things are not limited to the past. Inasmuch as the Japanese amino acid industry has been breaking such unique ground that it is also called the "amino acid culture," the competition has also been extremely severe.

In the past year also, technical innovations have appeared one after another. The chemical manufacturers Showa Denko and Mitsui Toatsu Chemical each developed a separate process to manufacture tryptophan (an amino acid, feed additive) inexpensively.

"The triptophan process is a mixture of synthesis and fermentation. We are also studying genetic engineering. Once the prospect for productivity and cost by combining this method with other processes is assured, we will switch any time." (M. Ito, new development promotion manager, Showa Denko)

However, although increasing productivity may well be desirable, is there any danger of repeating the same mistake as that of petroleum chemical products through overproduction?

"In the past several years, amino acids have become popular even in European and American countries, and we see a trend for shifting from a vitamin era to an amino acid era. Once cost is lowered in the future, it will probably spread even more in the world market. The future targets are literally "health products" which are intermediate between pharmaceuticals and food, and the market is likely to expand with the health industry boom." (Ajinomoto)

The amino acid industry is rather bullish.

It is said that even a larger scale bullish prospective wind than that of the amino acid industry is blowing in the chemical industry. What in the world is going on?

With a scornful look at petrochemicals, which are at the bottom of a slump suffering from a serious blow triggered by the oil shock, leaders of Mitsubishi Chemical and Toyo Rayon are boasting "the 21st century is indeed the era of the chemical industry."

"You may think they are jesting out of desperation. But that's not so," explained an economic journalist I know.

A revolutionary change is now about to take place in the chemical industry centered on biotechnology. Colossal size, concentration and high energy consumption used to be the barometers for big enterprises and big countries. However, after the oil shock, the direction of flow changed completely. This time, a direction that is totally the reverse of the previous trend has become the symbol for a major entity. Miniaturization, dispersion, energy-conservation and resource-conservation are the trends. That storm has been blowing for a while. Very large-scale integrated (VLSI) circuits, microcomputers and automobiles are some examples. In the midst of this, the chemical industry fell the farthest behind. However, that will

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change all at once with bioreactors. With their appearance, the gigantic plants will disappear, factories will become compact and the huge petrochemical complexes will gradually disappear from the Japanese archipelago after 1990."

Certainly, when it happens, it will unmistakably be a revolution. And that's the form the genetic engineering industry is taking. However, what is a bioreactor that brings about such a revolution? What part of the present structure of the chemical industry is changed by it, and how? In order to know that, it is necessary to understand the existing processes of the chemical industry.

For example, in the process of manufacturing ethylene oxide to be used as material for typical synthetic fibers or surface activators in the petrochemical industry, the material ethylene gas and oxygen gas are simultaneously fed into a catalytic layer. Metallic silver is used as a catalyst to promote the oxidation reaction. But that alone does not induce the reaction. The reaction begins when a high pressure of 20 atmospheres is added by a compressor in the catalytic layer and this is simultaneously heated to 300 degrees centigrade by a heater. Consequently, the equipment is huge and gray pipes of all sizes form a jungle.

On the other hand, in the human body or inside microorganisms, even more sophisticated chemical reactions than those found in such a chemical industry are constantly taking place under the relaxed conditions of normal temperature and normal pressure. Why does a living body work so well? The reason is none other than enzymes that mediate the biological reactions.

Then, can't we use those enzymes in ordinary chemical reactions as well? Anyone would arrive at such an idea. If the reactions of oxidation and reduction were carried out using enzymes, then neither a huge compressor nor a high-temperature reaction column would be necessary. Therefore, the large amount of electricity required for the reaction would be unnecessary. Moreover, the facilities would not need to be made of heat-resistant, pressure-resistant materials, which would naturally reduce construction and equipment cost. So, nothing but good would come of it.

Therefore, MITI also began to move last year. Within the 10-year plan for next-generation basic industrial technology research and development (31 billion yen for biotechnology), bioreactors were included along with recombinant DNA, mass cell culture and cell fusion. To support it in the private sector, 14 firms, including Mitsubishi Chemical, Sumitomo Chemical, Mitsui Toatsu, etc., jointly established a "biotechnology development technology research association," and a project through concerted government-private effort has started.

MITI roughly estimates that "once a full-scale bioreactor begins operation, the equipment expenditure will be reduced to less than one-fifth, and the energy cost will be less than half."

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Now, you may question why we didn't start sooner to achieve something that good.

In fact, prior to the appearance of petroleum chemistry, the chemical industry had a period when it was producing petrochemical materials, ethanol, butanol, propanol, etc., with a simple version of a bioreactor (fermentation method) using microorganisms.

However, enzymes and microorganism also have weak points. Fatal ones at that. First, the reaction is slow and productivity is low; and second, since enzymes are water-soluble proteins, used as enzyme reactants, they have to be discarded after each reaction; furthermore, since the reaction products are mixed with impurities, their separation and purification becomes difficult. There was a technical barrier.

"The prospect of breaking through that barrier was found in the two technologies of genetic engineering and enzyme engineering," stated S. Fukui, a professor at Kyoto University and an authority in enzyme engineering.

"Recently, enzyme research has made rapid progress, and the structures and functions of enzymes are understood fairly well. We understand what kind of enzymes should be used in what way for industrial applications. In addition to use those enzymes in continuous reactions, a technique to immobilize them with resins in metallic catalysts (immobilized enzymes) or a technique to immobilize microorganisms that produce enzymes (immobilized microorganisms) are beginning to be used considerably in practical applications. On the other hand, genetic engineering is excellent for providing enzymes with new functions or to modify microorganisms. Bioreactors have become a reality as a result of these two technologies being introduced."

In December 1980, Cetus of the United States announced at an international symposium in Israel the substance of bioreactor development for producing ethylene oxide and propylene oxide (raw material for polyester, detergents, cosmetics, etc.), and surprised the world.

Cetus was founded earlier than Genetech, which boasts being the "Sony of genetic engineering." Being backed by major corporations such as Standard Oil, National Distillers, Chevron, etc., Cetus had no interest in pharmaceuticals but had been studying fixed targets in the chemical industry and energy area from the beginning, and it is the biggest genetic engineering venture business. While other venture businesses were raising colorful advertising balloons, it remained silent and waited for the opportunity. "However, the Japanese firms need not fear Cetus," said the previously mentioned economic journalist.

In the area of bioreactors, Japanese firms appear to be lagging behind the United States at a glance. However, Japan is ahead in immobilized enzymes (microorganisms). The most advantageous aspect of the Japanese is that they are skillful in copying. In fact, enzymes are substances that are

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very easy to copy. Without hard work to discover new enzymes, it is said that there are good possibilities that "similar enzymes" are found by searching in the vicinity of good enzymes. Therefore, once they start to run, the Japanese are likely to get there first.

Installation of a bioreactor is equivalent to placing robots in automobile or semiconductor factories, so to speak, and the faster the quality improvement and productivity increase, the greater the possibility to conquer the world market first.

A wave of robot use is now reaching even medium and small enterprises in Japan. In the future, a bioreactor whirlwind to replace robots will probably sweep over the land.

Even without the comment of this journalist, we see that industrial circles will certainly be aflame toward 1990.

However, while industrial circles are racing all at once, I could not help but feel that something is being forgotten. What could that be?

After thinking about it for a while, I recalled what had been said by one of the pioneering molecular biologists some time ago:

"Actually, the real significance in the application of genetic engineering is in energy and food."

That professor also said that our enthusiasm to sharpen this leading technology should be directed toward energy and food, which will benefit mankind most of all.

Needless to say, Japan is an energy-dependent country. It has discarded the role of an agricultural nation.

However, genetic engineering research in energy and food areas is showing only slow progress.... As I saw this reality, 1990 seemed dark....

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