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JAPAN AS A TECHNO-SCIENTIFIC SOCIETY
THE NEW ROLE OF RESEARCH & DEVELOPMENT

by Alain-Marc Rieu

On June 24th 1996, the Japanese government submitted a plan to raise the budgets devoted to science and technology up to and in some cases beyond the level of its Western counterparts. This support is obviously directed toward research, but it will also finance all kinds of activities related to science and technology. Budgets, moreover, will be raised by 60% over a five-year period. Japan's Ministry of Education in 1995 also expressed its priority for research when it nearly doubled the budget of the Japan Society for the Promotion of Science. All of this activity expresses a collective strategy that bears further scrutiny, especially from the advanced industrial countries.

Japan is creating the basis of a new socioeconomic system. Two different approaches are cogently cogently and persuasively analyzing Japan's current economic reality. The "Watanabe approach" is led by Chihiro Watanabe, a former Ministry of International Trade and Industry, now professor at the Tokyo Institute of Technology. Watanabe focuses on how the Japan's ministries (especially MITI) should increase their stake in research in order to generate a "new system" of R&D. The "Kodama approach," named after Fumio Kodama, professor of R&D management at the University of Tokyo) shows how Japanese firms produce innovation and react to it. If each community at large can find common ground in these two strategies, it would present an even more formidable challenge to the other industrialized countries on how research can from now on be thought about and carried out.

A New Social Function

Research and development in Japan is undergoing a fairly radical transformation. Research at universities and R&D conducted in corporations can no longer coexist in two different worlds: they have to be linked into some new framework. When the will and the means to carry out such a broad vision reach a critical mass, a new situation emerges. The "paradigm shift" Kodama Fumio studies, briefly said the transition from the production of goods to the production of knowledge, cannot be reduced to the level of the firms. This shift brings its full meaning to bear when considered at the level of the socioeconomic system itself. Then its scope and expected consequences become even more evident.

Research in Japan is becoming a full social function of sorts; it has the potential of linking all these different activities and organizations into an informal network. This network could then coordinate, assist, evaluate, and organize the transfer of knowledge within the components of the net. By the level of investment and by the scale and range of these activities, R&D is becoming a new sector in a social system in which knowledge is produced and circulated like blood in a body. As it emerges, this function is bound to become more and more autonomous, to the point that it will play the role of mediator in the always-strained relations between the ministries, the business community and the academic world. This new level and scope of research activities will generate a new core of a new economic system, opening new fields for industries and services. Japan's future techno-scientific society is her conception of the post-industrial society.

This trend carries on the concept of an economy based on ever higher added value, the response to the energy crises of the 1970s that generated much of the industrial strength of the Japanese economy up until around 1990. This marked, finally, the end of the catch-up period. The question became: What's next? The decisive step was taken when the main ministries (MITI, but also the Ministry of Posts and Telecommunications, followed by a few others) launched global research programs aimed at creating the basis for this new socio economic development. The goal was to overcome the modernization period, its references to Western economies in general, and the catch-up phase in particular. The crisis has slowed this evolution and the MITI programs were fully reorganized in 1993, but this mutation is not questioned anymore. Many recent political measures are confirming it by providing the financial means to carry it through. Moreover, the impact of the anticipated changes on the social fabric are now taken into account.

Bureaucracy Versus Knowledge

It's tempting to dismiss these plans as a far-fetched vision of MITI masterminds of a techno-industrial utopia. But the budgets are here to prove it. Sometime around 1992 many in government felt that, because companies during recessions tend to reduce their R&D budgets, the government must step in. In 1987, just 21% of research (including military) was financed by the public budget, versus 49% in the US and 38% in Germany. This situation was deemed dangerous over the long term, in the belief that the Japanese economy runs the risk of losing the very basis of its success. R&D public budgets have risen an average of 6% per year since 1990; in 1996, the budget was 2.7 trillion yen (US$25 billion), the amount deemed necessary to compensate for a decline in R&D private expenditure.

The situation is paradoxical: the role of the bureaucracy is strongly criticized everywhere, but in a transitional period its overwhelming strong proclivity to keep the status quo is reinforced. Genuine reform is thus extraordinarily difficult in Japan. In Japan,

like elsewhere in the West, the bureaucracy is incapable of adapting to the present evolution even if it has understood its origins and consequences. The transfer of power to research--indeed, to knowledge in general--present a genuine threat to the established power equilibrium. The competence and achievements of the bureaucracy deserve to be recognized, but ministerial administrators cannot pretend to control the research activities they have to finance. It is of course difficult for a bureaucracy to recognize its limits and to organize its own overcoming.

Since the late 1980s, R&D centers and research programs have proliferated all over Japan. This is on the surface a sign of vitality, if only because the creation and building of structures precede a clear definition of their content (which is all too often redundant; the programs are better at transferring knowledge than at stimulating innovation). Moreover, in the universities and the laboratories, the long established hierarchies are, to put it mildly, changing very slowly. The creation of some "centers of excellence" cannot hide the basic inertia; it actually strengthens elitism instead of widening the badly needed social basis of research. MITI continues to pour enormous efforts, both conceptual and financial, into organizing this sector so that it can redefine and elevate its declining status.

National or Global

These difficulties should not hide the intended goal of a "soft" revolution toward a new socioeconomic order. In Japan, like many places in the world today, the general tension between the national and the global is intense, but the path has been chosen despite the day-to day decisions that sometimes contradict it. Underneath the often naive humanistic discourse, it is a fact that the Japanese economy is now fully internationalized. Its future is therefore strongly dependent on the state of the world economy. Japan, like it or not, is now forced to contribute as much as possible to global growth with no guarantee of profit; it must transfer an increasing body of its knowledge to the world. The power structure has to master the speed and level of this massive transfer of knowledge.

This specific social function of R&D requires to loosen the system. This is what is meant by liberalization. The more the center reconstructs itself through research, the more its periphery can spread and specialize. Over the medium term it allows companies to adapt better to local conditions, thus providing fertile ground for rich sources of innovation. A whole new hierarchy of activities is in the making, with Japan becoming the head of a network of research centers through which knowledge is produced and circulated, and from which the national basis of industrial wealth is indefinitely reconstructed. The limits and the modalities of this kind of network cannot be foreseen.

This implementation of this goal is actively being prepared by the elites who are still sure that they are legitimately in charge of the cohesion and future of Japanese society. The obstacles to this are formidable because this kind of evolution involves Japanese civil society

itself. No one source of power can hope or pretend to identify themselves with the core of the new socioeconomic order. As the R&D sector gains more and more autonomy, no one can predict where the new point of equilibrium will finally be found.

The Japanese challenge

This soft revolution has largely been ignored outside Japan, even though there is so much to learn from it. It is easy to understand why. The distinction between private and public, mostly in their American definitions, makes it nearly impossible to understand Japanese reality. It transforms the methodological as well as ideological distinction between two ideal poles into the opposition of two completely different sectors of activities. This web of formal/informal groups and half-public/half-private institutions -which are in a nearly constant state of conflict and collaboration- needs to be thoroughly studied in order to develop the international research collaborations Japan is so eager to promote. The reconstruction of this web by and within the R&D community is the high-stakes objective of the present mutations.

Collaborations can only be successful if each partner knows what the other is expecting; they cannot be reduced to the traditional exchange of information and researchers. It is obviously necessary to take into account the scientific goals (which are very similar) but the institutional framework, the social, economic, and political objectives in which R&D is inscribed and at work are crucial as well. These goals and objectives are today clearly related in the level of development and autonomy of the R&D sector in each country. This is why the mutation of R&D in Japan deserves to be carefully studied: in too many countries these questions are never fully raised.

In 1950, a French political analyst, Jean-Jacques Servan-Schreiber spoke of the "American challenge". He wanted to explain to post-war Western Europe the industrial power, the conception of society and the way of life which had debarked in Europe with the liberating armies. America was not to be seen as a peaceful threat but as a call for introspection and reform. The time is ripe to talk of a "Japanese challenge", even if Japan is currently in a serious crisis. Responding to this challenge does not mean simply increasing budgets, though that would be a start. Deep structural reforms are necessary, power relations have to be questioned, institutions and hierarchies have to change. It is far from certain whether Japan will be able to respond fully to the challenge it has launched. Therefore the stakes are high.

Japan's experience should induce every industrial country to very carefully consider the organization and scope of R&D, its social basis, its potential for change, and the reforms necessary to make it happen. The emergence of such a new autonomous sector and the unprecedented scale of collaborative work it can induce show that this evolution opens to

industrial societies a trajectory to develop different from the one they have followed till now and which leads them nowhere in the future.

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