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Watch the 17 per cent solution

Spokesmen for United States science have expressed delight with the recent increase of research spending by industry. But their optimism is ill-founded and may be premature.

Has United States industry changed its attitude towards research? After years of only modest increases of spending on research and development and often of self-confessed neglect, corporations have now increased their spending mightily. A much discussed and recently published McGraw-Hill survey has shown that corporate spending will increase in 1982 by 17 per cent. If inflation this year remains at 6.5 per cent, the real increase will be more than 10 per cent — and this on the heels of an increase of 16 per cent in 1981. So some spokesmen for US science, surveying the mixed outlook for government support that will persist for the foreseeable future (see *Nature* 8 July, p.112) have greeted the new industry money with glee. For example, Dr Frank Press, president of the National Academy of Sciences, calls them signs of “a major change in attitude”. McGraw-Hill, in releasing its survey, called it evidence of “an R&D renaissance”. But it may be premature to pat industrial managers on the back for new-found wisdom.

Three caveats are important. The first is uncertainty about the working of the Economic Recovery Tax Act, signed by President Reagan in April 1981 and intended, among other things, to spur investment in research. No definitive analysis has been made of the act's specific impact on corporations, although industry leaders acknowledge that it has been considerable. If, for example, a corporation adds a new wing to a plant that includes some experimental production techniques, it may count as a research and development item and qualify for special tax treatment. Corporation accountants would be crazy not to take every advantage they can of the act, which has probably swollen many corporate statements of research spending without causing research itself — let alone long-term research — to grow. So much of the increase may be a paper benefit.

A second caveat is the dog that didn't bark. What has happened to the large fraction of industrial research and development that has to go for “defensive” research to get new products or processes through the mass of federal regulation? For years, in the 1970s, industry spokesmen used to complain in no uncertain terms that, if only government would lift the regulatory burden, industry could stop spending lopsided amounts on this short-term work and invest in the long-term high-risk innovative research that could keep its long-term trade position secure. Now, quite suddenly, industrial managers have stopped complaining. What is really going on? The Reagan Administration has lifted many regulatory burdens, to be sure, but just as many remain, particularly affecting the chemical and pharmaceutical industries. Have companies decreased the amount of “defensive” research they are doing and, as they promised, switched to more long-term projects? That seems unlikely, especially as some industry researchers have been saying privately that they are now under more pressure than ever to produce quick results. Most probably, industry's habits have not changed much, that just as much (or more) “defensive” research is being done and that industry spokesmen are quieter because an administration sympathetic to their complaints is in office. The argument that federal regulation has prevented companies from doing long-term research may have been a hoax in the first place.

A third and final ground for caution is the Administration's defence build-up, which is sprinkling money into the electronics, information and aerospace industries like spring rain. Predictably, in the McGraw-Hill survey, major defence

contractors such as IBM, Boeing, United Technologies and Cray Research lead the pack. Robert Reich, of Harvard University's John F. Kennedy School of Government, has eloquently pointed out how the Department of Defense acts as the American equivalent of Japan's Ministry of International Trade and Industry (MITI) by encouraging the development of key technologies such as lasers, integrated circuits and space gadgets. But whereas MITI assists these technologies in civilian markets directly, the Pentagon does so only indirectly and over the longer term. But, in the short run, massive Pentagon research spending distracts industry's attention from civilian products.

So the significance of the 17 per cent “solution” now being hailed is really unknown. Trends in United States industrial research bear serious study. Indeed, in view of the country's high technology trade balance, a close sceptical look is urgently necessary, for changes must be made now to improve industry's performance in the future. It is wrong to assume — as Americans often do — that just because money is being spent on a problem it is being solved.

Two structural problems having nothing to do with money should be looked at closely. One is the unsolved problem of US industry's relations with government in the development of high technology industries and products that could affect future trade. As Reich says, countries such as Japan that compete successfully in international markets have smooth well-understood relations between government and industry. The ball is passed between these sectors smoothly, as with a well-coached basket-ball team. In spite of the Reagan Administration's pro-industry stance, its easing of regulations and bowing to many of industry's special interests, the underlying stand-off between the private and public sectors in the United States remains. As a simple example, what will happen to solar energy technology in the United States, now that the Reagan Administration has dropped the government's contribution? Because of poor industry/government coordination in this field, earlier investment will be lost. Will the Japanese win that one too?

A second problem is internal to the companies themselves. Although many large corporations spend money on research and development, their top management may pay it little heed; research managers are told to mind their own business, which is “merely technical”, rather than to suggest changes that could change the way the corporation does business. General Motors (GM), for example, emerged as the top spender in the McGraw-Hill survey: it will spend an estimated \$2,200 million in 1982 (out of industry's total spending of \$59,700 million). But at GM “to be assigned to research means you're dead”. Clearly relations between top management and research people must be improved. How many chief executive officers, for example, have lately come from research rather than the law, accountancy or advertising?

The debate over industrial research raises questions, finally, about the much-touted liaison between US industry and universities. So far, it has the air of a flirtation rather than a stable marriage. If corporations *have* changed their attitudes, and are more seriously investing in long-term undirected research, they should see how much they have in common with the university research scene. Then the partnership can be stable, and not just kiss-and-tell. Spokesmen of science should be asking, have industrial managers become suddenly and miraculously wiser?