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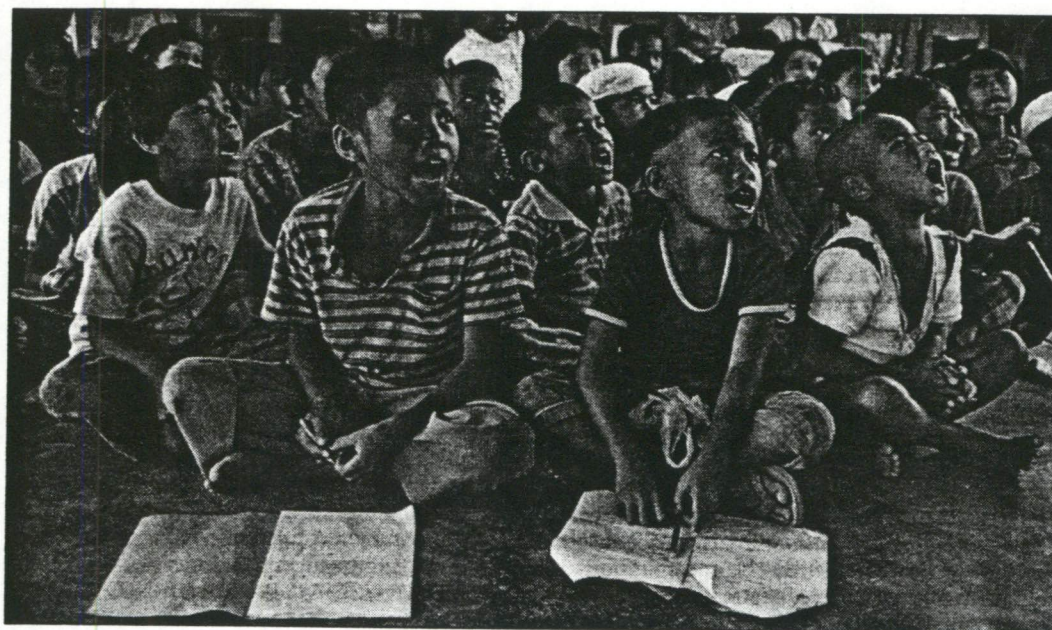
The Economist

A SURVEY OF
ASIA'S EMERGING ECONOMIES

Where tigers breed



ASIA'S EMERGING ECONOMIES



Burning bright

FOUR decades ago, Asia seemed condemned to poverty. Half of Japan's workforce was in the fields; the other half in factories that were only 15% as productive as America's. "Made in Japan" meant gimcrack. Shanghai, previously one of Asia's most dynamic cities, had fallen to Mao's Communists; its refugees streamed on to a hopeless little island called Taiwan. Korea was poorer than Sudan and on the brink of a devastating civil war. Hong Kong and Singapore were busy little ports, but not a lot more. A pundit, asked to choose the Asian cities of the future, would probably have chosen Manila, Rangoon and Saigon.

Today, two of that trio are basket cases and Manila is rapidly heading that way. While they have languished, Japan has emerged as the world's industrial superpower. The four economic "tigers" of East Asia—South Korea, Taiwan, Singapore and Hong Kong—have forged the fastest industrial revolutions the world has ever seen. Behind them are another four countries which are getting close to the point of industrial take-off—Thailand, Malaysia, Indonesia and, most interestingly, China.

This survey will centre on these eight countries. Chart 1 (on the next page) shows how fast they are emerging. China and South Korea, the two largest economies in the group, grew on average three times faster than the OECD economies during the 1980s. All eight economies have proved that they can sustain growth rates of over 7% a year. At that speed an economy doubles in size each decade.

Assuming that Asia's super-competitive economies keep growing two-to-three times faster than the older industrial economies, by 2000 the average Taiwanese will be richer than most New Zealand-

ers and catching up fast with most Australians. Hong Kongers will be richer than their erstwhile colonisers, the British, and Singaporeans better off than Italians. South Koreans, the poorest of the tigers' people with GDP per head of just over \$6,000 a year, will be as wealthy as the Irish. By the middle of the 21st century there will have been a shift in economic power away from Europe and North America to the western side of the Pacific Rim.

For those who are innately suspicious of macro-economic figures, the micro-statistics tell the same story. Hong Kongers born today can expect to live 78 years—second only to Japan and a couple of years longer than most Americans. The average Taiwanese is twice as likely to go to university as his (or her) British peer. Between 1966 and 1985 the real earnings of South Koreans employed in manufacturing increased at an average rate of 8.1% a year. Life expectancy for women in China and Indonesia—two giants still at the toddler stage in economic terms—increased respectively from 59 and 45 years in 1965, to 71 and 63 years in 1989.

The benefits of growth have been remarkably evenly distributed, so that "the material conditions of life, even for the unskilled, have been transformed in a single generation," writes Robert Wade, the author of one of the best books on the tigers*. Throughout the arc of countries that sweeps down from South Korea to Indonesia, there is profound optimism that life will continue to get better and a readiness to work hard to ensure that it does.

"The key question is, if countries have access to

The dynamism of East and South-East Asia has no precedent in economic history. But, argues Andrew Cowley, maintaining the momentum will involve change and challenge

*Governing the Market: Economic Theory and the Role of Government in East Asian Industrialisation. Princeton University Press



more or less the same technology and the same resources, and they all operate essentially free-market systems, competing on a level playing-field, what makes some more successful than others?" So asks Lee Kuan Yew, the prime minister of Singapore for 31 years until he stepped down last year.

The answer, Mr Lee believes, lies in what he calls "the intangibles". By this he means "the coherence of a society, its commitment to common ideals, goals and values." The vital intangibles are a "belief in hard work, thrift, filial piety, national pride." These qualities are now often labelled Confucianism. This cultural explanation of East Asia's rise makes some observers uneasy. Not long ago Confucian societies' obsession with the veneration of elders was touted as a reason why they were condemned to remain inflexible and poor. Besides, Confucianism as it is now defined is not unique to East Asia; it is almost identical to the Calvinist work ethic described by Max Weber in 1904.

Chi-Chu Chen, of Taiwan's International Commercial Bank of China, has an altogether simpler explanation: "What is the difference between Taiwan and unsuccessful poor countries? My conclusion is we are economic animals, probably the greediest people on earth. The most important thing is to give the man in the street an incentive to work. Here self-interest has been given a free rein."

Learning the lessons

The success of the tigers makes it easy to gloss over the differences in the way the government of each has encouraged its people to better their condition. Hong Kong is the only one that can claim to be *laissez-faire* (although, even there, two-fifths of housing is subsidised by the government). Singapore, the other city state, has one of the most *dirigiste* governments on earth, now devoting itself to creating an "attractive package" for global companies looking for a base in the region. South Korea's equally interventionist government has concentrated on keeping foreign companies out, while feeding credit to rear a handful of wholly-Korean, world-scale companies. By contrast with Korea, Taiwan's industrial structure, with a workforce of 8.3m employed in over 150,000 factories, could have been incubated on a different planet.

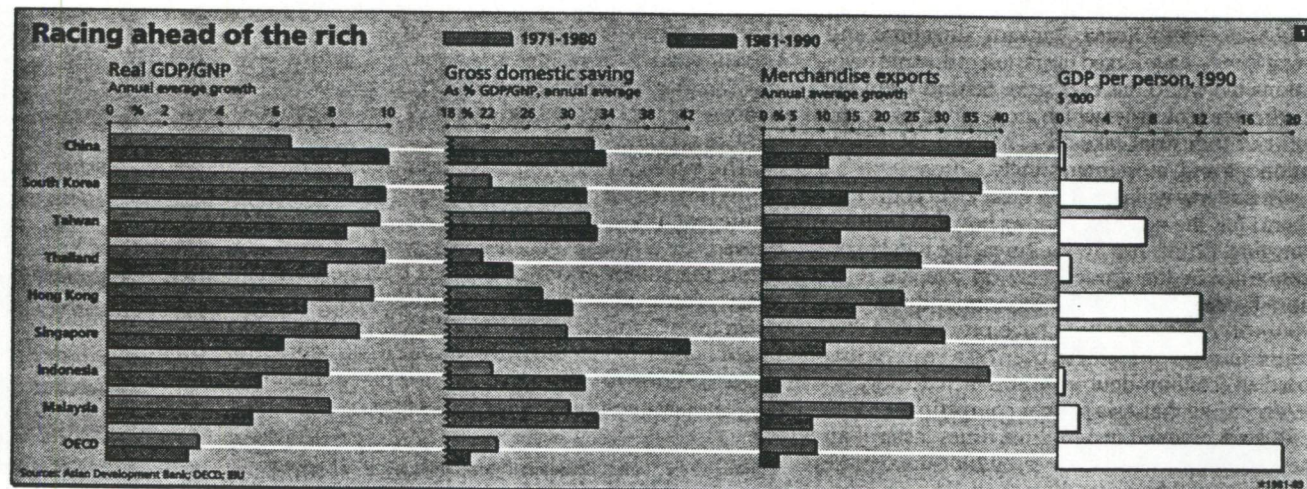
There are, however, some fundamental lessons that have been learnt in common.

- The priority of state action should be economic development, defined not by the government's ability to hand out welfare payments to the less privileged, but rather by growth in output, productivity and, above all, international competitiveness. Resource-poor countries with small domestic markets can grow only if they sell abroad. The tigers have been so successful at penetrating overseas markets that today their combined merchandise exports are twice those of all the countries in Central and Latin America, even though the latter have six times the population and are on the doorstep of the world's largest single market.

- Rapid growth is impossible without a commitment to markets and private property. In Taiwan the government leaves companies to do whatever they want, within the bounds it has set. In sluggish India, on the other hand, the government has tried to control everything and ended up serving only the vested interests of Indian big business.

- Markets do not have to be completely free. Apart from Hong Kong, the state has guided markets with instruments formulated by an elite bureaucracy—"an economic general staff," as Mr Wade calls it. There are numerous institutions for consultations between the bureaucrats and business—what else are golf courses for? A researcher at the Korea Development Institute, the government's economic think-tank, says that no one is sure how many laws there are in South Korea regulating intervention in individual industries—it might be over 1,000. Some of these efforts to guide the market have paid off, others have flopped. But Korea's government, and those of the other tigers, have been careful to get prices right so that producers can always tell if their goods are internationally competitive.

- A relatively equal distribution of incomes and relatively low taxes motivate workers. The pay differential between a production-line worker for Samsung, Korea's largest company, and its president is nine-fold. At any American company of a comparable size, the differential would be closer to 100. The feeling that everyone is in the same boat has been one of the factors that has allowed the tigers' governments to get away with being authoritarian for so long. It has given governments the power to push through unpopular measures in times of economic crisis, which in East Asia means whenever growth slips below 5% a year.



• The last lesson is probably the most important: investing in education pays in spades. The tigers' single biggest source of comparative advantage is their well-educated workers.

These lessons have been studied by the tigers' neighbours, who are now applying some of them. Almost everything about China's political future is uncertain. However, the momentum built up by the economic reforms introduced by Deng Xiaoping in 1979, which began the long process of opening up China's economy to the world, now looks irreversible, especially in the southern coastal provinces. China will have the fastest-growing economy in Asia during the first half of this decade.

The collapse in raw-material prices in the mid-1980s pushed the commodity exporters of South-East Asia—Thailand, Malaysia and Indonesia—into a recession, prompting all three to introduce fundamental reforms. They lifted old restrictions on foreign investment and deregulated their economies. The results have been impressive. Thailand was the world's fastest-growing economy in the second half of the 1980s. Indonesia's manufactured goods now earn more abroad than its exports of oil and gas. Earlier this year the Malaysian government unveiled its masterplan to make Malaysia a "fully developed country" by 2020. Economic growth of 7½% a year—the plan's basic premise—seems entirely possible.

But not easy. Asia's emerging economies are at a crossroads. They have done the simple bit. Move Thais or Indonesians out of a paddy field into a textile mill and you get a sharp increase in productivity, without much increase in skills. Can the second generation of emerging economies build on their present modest industrial base before their rising costs force foreign investors to look elsewhere?

A still more intriguing challenge faces the first generation of emerging economies. They have perfected the art of taking apart other people's prod-

ucts and working out how to make them almost as well and a whole lot cheaper. Now that they are becoming high-cost economies, the tigers must work out how to develop and market their own products, an altogether more difficult proposition. Easy access to the American market, which has helped to cover up some of their earlier mistakes, may no longer be available.

This survey is not about the doctrinal disputes between economic liberals and believers, like Mr Wade, in the "governed market". Instead, it will dwell on the engine-room—the companies that have driven growth and will succeed or go bust in the restructuring that lies ahead.

Emerging Asia is spawning a new generation of companies that, within 10-15 years, will be almost as well-known as Toyota, Sony and Mitsubishi are today. Japan has taught them that comparative advantage over competitors is not inherited, it is created. Taiwan and Korea can draw on some of the most technically-skilled labour available anywhere in the world. China has hundreds of millions of people who, given the chance, are the same as Hong Kongers—dynamic and industrious. The Chinese diaspora in Hong Kong, Taiwan and farther afield has the skills and capital to develop China.

These rapidly expanding companies have a raw entrepreneurialism that requires observers to ask not what will make them grow, but what can stop them? As a sign on an office wall in Taipei demands, "Why aren't you a millionaire yet?"



Tomorrow belongs to me



Risk and reward

TONY CHAO, from Taiwan, runs a clothing factory in an industrial estate near Sri Lanka's main airport. He has found an unusual niche. His workers sew hideous clothes—stone-washed denim mini-skirts covered in sequins are a popular line. They are shipped to Vladivostok and loaded onto the trans-Siberian railway. A couple of crates get pushed off at each stop into the arms of consumers desperate to buy anything.

Economic miracles are created by thousands of Tony Chao's, always on the look-out for a new market or product. Some 150 years ago, hard-faced men from Manchester were scouring the world for opportunities in just the same way. In Asia today's hard-faced men follow one of two different styles of doing business: the Japanese or the Chinese.

The emerging economies of Asia are Japan's backyard. Japanese companies and their products are everywhere. Millions of Asians go to work in a Japanese car, sit in an office cooled by Japanese air-conditioners, try to sell their products to a Japanese company. After work, yuppies in Kuala Lumpur

head for karaoke bars, the Japanese fad sweeping Asia even faster than McDonald's.

Take Mitsui, Japan's oldest trading house (it has been around longer than the Bank of England). Its organisational chart has four overseas trading regions with their own headquarters: America, Europe, the Middle East and Oceania (Australia and the Pacific). Mitsui's 200-odd joint ventures in Asia are run straight from Tokyo. This network, duplicated by the other *zaibatsu*, or trading groups, ensures that Japan is Asia's dominant supplier of imports, capital and technology.

The 1990s version of a kinder and gentler Greater Asian Sphere of Co-Prosperity makes some Japanese nervous. "We are very afraid of the political problems created by the over-dominance of Japanese business in some Asian markets," says a senior official in the planning department of Japan's Ministry of Foreign Affairs. "Japanese companies are in general indifferent to calls for more local involvement. In particular, they are slow to promote non-Japanese." How long will it be before memo-

Fortune favours the brave—and the far-sighted



ries of how Japan behaved in the second world war create an anti-Japanese backlash in the countries now emerging in Japan's wake?

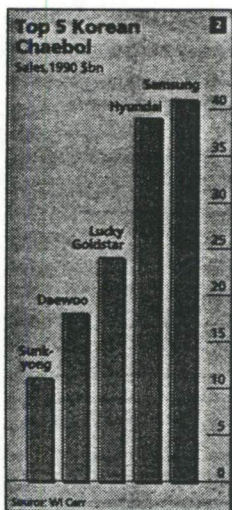
The answer is a very long time indeed. The economic animals of East and South-East Asia are realists and know that for the foreseeable future they will need Japan more than it needs them. Their pragmatism has ensured that the old wounds have not festered. The clearest indication so far of this was Emperor Akihito's tour of Thailand, Malaysia and Indonesia in September, the first time a Japanese emperor had visited South-East Asia and the first time one had apologised, obliquely, for "the horrors of that unfortunate war". A Malaysian cabinet minister suggested that the emperor's visit was less controversial than one by George Bush would have been.

Korea has the most difficult relationship with Japan, its former coloniser. Koreans delight in explaining to visitors how Japanese culture is a bastardised version of the Korean original. Their businessmen bridle at suggestions they do business in a Japanese way. It is clear, however, that the *chaebol* which dominate the Korean economy are self-conscious imitations of the *zaibatsu* which built Japan. The Korean conglomerates show the naked aggression that wealth has now blunted in Japan. Their only concern about over-dominance is that they may not achieve it.

When Hyundai decided to build ships in 1973, it began by constructing the world's largest shipyard. Its competitors laughed, and then went bust. Since then Hyundai has become the first big entrant into the world market for cars since the Japanese in the 1960s. POSCO is now lauded by the World Bank as "arguably the world's most efficient producer of steel", which is ironic given that the Bank refused to back the company in the early 1970s because Korea was deemed to have no comparative advantage in steel. In the early 1980s four *chaebol* led a charge into semiconductors. A few billion dollars later, in 1988, Samsung introduced its own four megabyte DRAM (dynamic random access memory) chip only six months behind Toshiba.

Samsung's corporate motto is, "We do business for the sake of nation-building." The government has returned the favour by underwriting the company's riskiest ventures. Under the leadership of Lee Kun-hee, the third son of Samsung's founder, Samsung aims to become one of the ten biggest companies in the world by the turn of the century.

"Scaling down is the great corporate sin. Samsung can expand at 30% a year; we would be unhappy with less," says Park Ung-soh, the president of Samsung's petrochemical operations. The company has just invested about \$3 billion in a naphtha cracker. In a typical bout of "me-tooism", four more *chaebol* are following Samsung into petrochemicals. Massive over-capacity will inevitably lead to an export price war. Is Mr Park worried? Not really: "There will be problems in the short-term, but we will be a major player in the world if we do it right. By 1995 supply and demand should be healthy. In the 1960s Japan almost destroyed the world petrochemical industry by overbuilding. Look where it is today." Samsung will not wait until 1995 before plunging into its next new field—aerospace. It has already started.



The Chinese are different. "A company for carrying on an undertaking of Great Advantage, but no-one to know what it is," is how the South Sea Company described itself in 1711. The description could well be applied to many Chinese conglomerates today. The tycoon is the only person who knows how the cash flows around the myriad companies he has single-handedly created. Minority shareholders are at his mercy.

This is not the least of the typical Chinese company's faults. According to the canons of western management theory, it gets most things wrong. Its strategy is usually centred on quick trading profits, rather than the long term. Personal relationships are exploited to win monopolies. One man exercises iron control over the activities of sprawling conglomerates between whose parts there is no attempt at synergy. The Salim Group, for example, was founded in Indonesia by Liem Sioe Liong and prospered thanks to presidential favours—Mr Liem supplied General Sukarno while he was in the jungle fighting the Dutch. Today Mr Liem presides over 300 subsidiaries, which account for about 5% of Indonesia's GDP.

Any company that has got that big must be getting something right. Hong Kong, with a population of 5.9m, had 13 (American-dollar) billionaires at last count. The Sophonpanich family in Thailand and the Kuoks in Malaysia rival the Liems in wealth. Indonesia's Chinese minority, only 5% of the total population, controls an estimated 75% of corporate assets. For the past 30 years Malaysian politics has been dominated by efforts to redistribute wealth from the Chinese minority to the Malay majority. Half of Thailand's GDP is produced by Bangkok, a Chinese city in Thai disguise.

The life blood of a Chinese company is *guanxi*—connections. Penetrating layers of *guanxi* is like peeling an onion: first come connections between people with ancestors from the same province in China; then people from the same clan or village; finally, the family. It does not matter much whether a Chinese businessman is in Hong Kong or New York, he will always operate through *guanxi*. But these networks do not enforce conformity. Chinese tend to be far less concerned with consensus than the Japanese. As long as they honour their word and look after their own, they can do whatever they want.

This environment offers Chinese companies some fundamental advantages. The networks of *guanxi* are now global; so are the companies they spawn. The patriarch sits in Hong Kong, looking after the finances; number-one son runs the factories in China or Thailand; number-two son went to a top university in America and now works as a genteel form of industrial spy in California.

The network functions like a living organism, excelling at producing products quickly and cheaply. This is why Hong Kong has supplanted Italy as the world's top producer of fashion goods. It is how tiny Taiwanese companies run rings around giants in the personal-computer market.

The paradox is that the strength of centralised control, usually under one man, is also the Chinese company's weakness. The founding dynast cannot live much longer. In some cases there is no obvious successor; in others the empire is too big to be

handed over to one man. Most tycoons are choosing the same solution—bringing in the suits with MBAs to run their companies after they are gone.

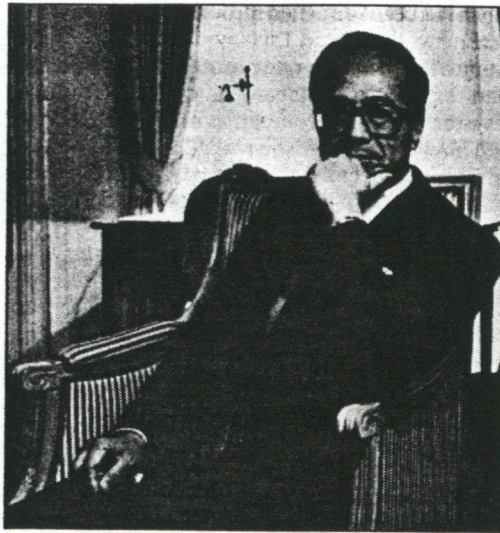
Li Ka-shing, Hong Kong's richest man, has gone furthest down this route. His family holding company, Cheung Kong, is run in the traditional way. But its biggest asset is its controlling stake in Hutchison Whampoa, one of Hong Kong's oldest trading houses, which is run (like the other hongks) by westerners.

In Indonesia the Soeryadjaya family is bringing in professional managers to run its Astra empire. It is trying to make more of the components for the Toyotas, Hondas and BMWs it assembles for the Indonesian market. Astra has even started to sponsor a special programme at INSEAD, the business school outside Paris. In Singapore, Kwek Hong Png, the 79-year-old chieftain of the Hong Leong group, has brought in the local head of IBM as his group's managing director.

Doubtless some Chinese-owned companies will evolve into conventional (in a western sense) companies. Others will go bust. The point is that within the Chinese diaspora, there will always be a new generation of tycoons on the make.

And what of European and American companies? "In some Asian markets, western companies were dominant historically. Many of them have given up this position without much of a fight, rather like the fall of Singapore in 1941," says Kevin Jones, a principal in McKinsey's office in Tokyo. It is all too easy for western companies to find reasons not to take Asia seriously: protectionism excludes them from some markets; they need to conserve their resources to fight off the Japanese at home; the market may be growing fast, but it is small now; and so on. The problem is that by the time a market is attractive, it will often be too late.

There are exceptions. Du Pont and ICI are bravely taking on the Koreans in the chemicals market. Du Pont aims to spend \$2 billion by the



Li Ka-shing, Hong Kong's Croesus

turn of the century increasing its nylon capacity in Asia; ICI has spent £400m (\$680m) since 1988 on expanding its capacity there. Western companies have been successful in areas where their Asian rivals are weakest, especially services and brand names. Citicorp has taken a 20-year view on the development of its retail-banking network. It is poaching the richest customers from local rivals. Toyota uses Inchcape, a British trading house, as its distributor in several markets. Procter & Gamble has learnt from its disasters in Japan in the late 1970s and is now expanding in emerging Asia. Unilever, its main rival, is the biggest consumer-products company in Indonesia, the world's fifth most populous country.

The list could go on. It cannot change the fact that western companies are bit-part players. Asia's miracle economies are being driven by Asian companies.



Triumphant abroad

JAPANESE and Chinese businesses indulged in an orgy of investment in the second half of the 1980s. Now that capital has become more expensive and the emerging economies are temporarily sated with investment, it is possible to discern the outlines of what has, and has not, happened.

Imagine it is late 1986 and you are managing a consumer electronics factory in Japan. Your business is in trouble. The deal struck at the Plaza Hotel the year before has doubled the value of the yen—the currency your manufacturing costs are based in—against the dollar, the currency of your biggest export market. Your workers are expensive and it is hard to find anyone to do jobs that involve the three ks—*kitamai*, *kiken* or *kitsui* (dirty, dangerous or tough). The currencies of your most aggressive competitors, the Taiwanese and Koreans, have risen only slightly against the dollar and they are snatching market share away from you. What do you do?

One answer was to move as much of your manufacturing as possible offshore to lower-cost coun-

tries, preferably with currencies loosely pegged to the dollar. Between fiscal years 1988 and 1990, Japanese companies made 2,494 investments worth \$11 billion in Indonesia, Malaysia, Singapore and Thailand. The latter has been the darling of Japanese companies: by 1990 they were opening factories in Thailand at the rate of one every 2½ days. Thomas Zengage, a management consultant in Tokyo, calls the process "Operation Sushi Storm".

South Korean and Taiwanese firms have turned from interested observers to imitators. As their own costs have risen, they have had three choices: move production offshore; make something else with more value added; or go bankrupt. Many companies have chosen the first route because it offers a quicker return than spending on research and development. During 1990 cumulative foreign investment by Korean companies doubled to \$2.3 billion (still a low figure for an economy with exports worth roughly \$72 billion this year). Taiwan's foreign investments are harder to track, because so

Foreign adventures make both money and sense—usually



T-shirt market



much has been funnelled through the overseas Chinese network to avoid Taiwan's tax and other regulations. But in at least one country—Malaysia—Taiwan has replaced Japan as the largest single investor. Taiwanese companies invested M\$6.3 billion (\$2.3 billion) there during 1990.

The lucky recipients find it hard to avoid complacency. This could hurt them. Cheap labour is the only attraction most poor countries can offer potential investors. It can be used to establish an industrial base of textile plants and simple assembly lines. Many developing countries then fail to leap to a virtuous cycle of industrialisation, in which an ever higher proportion of value is added by domestic producers capable of producing export-quality goods.

Chart 3 illustrates the problem for Thailand and Malaysia. However cheap their workers are, there is always somewhere where people will work for less. Vietnam's cost advantage explains why Asia's smart money expects the nation to grow so rapidly from its low base—Vietnamese GDP per head is officially \$200—once the Communist Party loses its grip on power. Rapid increases in wages and land prices in Thailand and Malaysia could force manufacturers in the most labour-intensive industries to start another Operation Sushi Storm—the shift into Vietnam, China and Bangladesh.

Second, whereas South-East Asia had few competitors as an attractive site to build a factory in the mid-1980s, the collapse of communism in Europe, the European single market and the mooted North American free-trade area have created some interesting new possibilities. The chart shows the attractions of Mexico and Hungary.

The third point is that T-shirts from Taiwan cost only 50% more than those from Thailand, though Taiwan's factory wages are four times higher. As you move upmarket, this productivity gap between the well-educated workers of the tigers and the less skilled workers of South-East Asia gets wider.

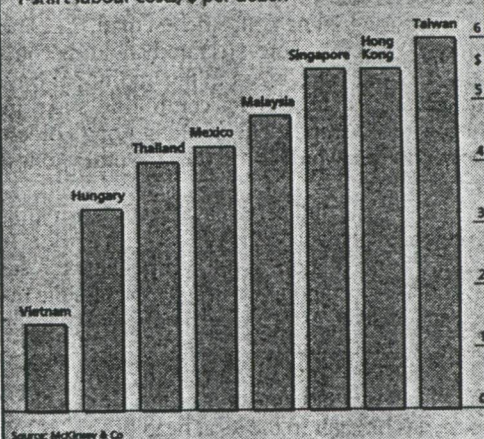
Setting a standard

The managers of Japanese factories in South-East Asia do not like talking about productivity gaps. When asked how their workers are performing, they smile politely and say that it is just like home. As they talk, the hit squads from head office are probably scratching their heads over how to get quality and productivity up to the required levels. One big Japanese electronics firm, Sharp, has sent teams to 150 of its suppliers in Thailand in an effort to raise their standards.

Japanese companies are wondering when it makes sense to move factories offshore. It is always worth making consumer products close to the intended market, because this allows you to cater to each market's foibles and helps to undercut protectionist pressure. But when it comes to mega-industries, it may not be sensible to move factories to developing Asia. A senior executive at Mitsubishi Motors explains: "Basically we are not transferring manufacturing to Asian countries—their only advantage is cheap labour. In our industry you need economies of scale and a large network of reliable suppliers. Most components are still cheaper when they are made in Japan. In some markets we can't even source plastic bags locally—we have to import

Threadbare

T-shirt labour costs, \$ per dozen



them from Japan." His ideal factory floor does not swarm with cheap labour. It is deserted, the work done by robots, with zero defects.

In other words, moving production offshore is a way to delay the sunset over some low-technology industries. But it dodges the challenge of making a high-cost economy competitive through the development of domestic technology and services.

For the second generation of emerging economies—Thailand, Malaysia and Indonesia—the implications are worrying. Japanese investment, the fuel for their rapid growth over the past four years, is slowing. Many Japanese companies have now built the factories they will need to meet the expected growth in domestic demand in these three markets over the next five years or so. That frees them to concentrate on the American and European markets. (To put things in perspective, Japanese companies had invested \$40.3 billion in manufacturing plants in North America by the end of 1990, double their investment in all of Asia.)

This slowdown in foreign investment comes at a difficult time. Thailand, Malaysia and Indonesia are expected to have current-account deficits ranging from \$4 billion to over \$8 billion (in Thailand's case) this year. Their recent success means they will have no difficulty in financing these deficits. But what about their underlying trade deficits with Japan? Indonesia is the only country in South-East Asia that has a trade surplus with Japan, thanks to its reserves of oil and gas. Thailand has the biggest deficit—in 1990 it was \$5 billion. Conventional wisdom argues that this deficit has been caused by imports of capital equipment and will start to close as soon as the new plant is working. What this argument ignores is that much of the equipment is to meet domestic demand, and it will need a constant stream of Japanese spare parts. To pay for them, Thai, Malaysian and Indonesian producers will either have to penetrate the Japanese market—succeeding where so many others have failed—or they will have to outrun the tigers in the rest of the world.

The halcyon days are over in South-East Asia, at least for the time-being. For the front runners of the late 1980s, a lot of hard pounding lies ahead. One more challenge they will have to face is competition from the rising star of the 1990s—southern China.

Geography and geometry

SINGAPORE has two perennial headaches. The first is its tiny size. Its total workforce is only 1.3m and is not growing. That means each time the economy booms, the labour market gets uncomfortably tight and opportunities are missed. The second problem is its reliance on foreign investment. It has persuaded over 3,000 multinationals to set up offices in Singapore, but the competition for their capital is getting tougher.

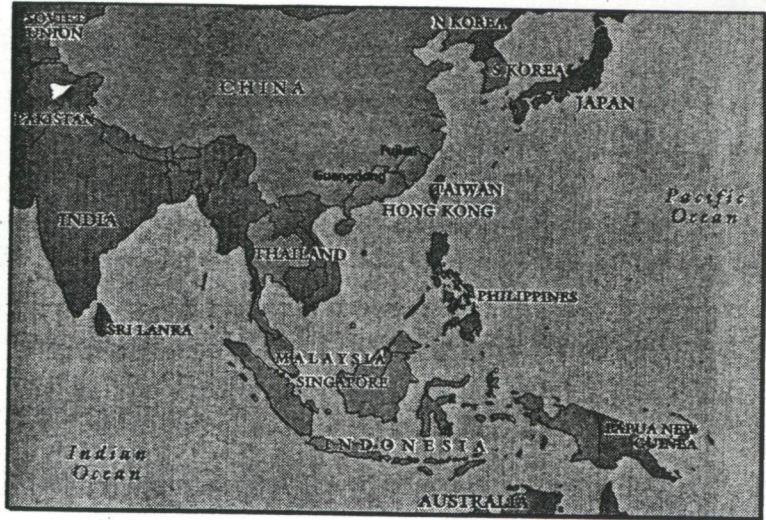
The Singapore government's Economic Development Board has come up with a typically clever remedy. This is the "growth triangle", covering a 50 km radius around Singapore. It includes much of the southern Malaysian state of Johore and a handful of Indonesian islands off the coast of Sumatra. The idea is that investors will use Singapore as their high-tech base to design, market and distribute products made in low-cost factories in the neighbouring countries. The shift of labour-intensive industries from Singapore to Johore is long established. It is the Indonesian end that is new.

The Batam Industrial Corporation (Batamindo), 40% owned by Singaporean interests and 60% by the Salim Group, is transforming the island of Batam into a floating factory, two-thirds the size of Singapore and only a 30-minute boat trip from its financial district. Batamindo will secure all the permits from the nightmarish Indonesian bureaucracy, and investors can hold 100% of the equity in their venture for the first five years; after that the stake must be cut to 95%. (Elsewhere in Indonesia, foreign companies have to enter into 50:50 ventures with Indonesian partners.) Batamindo will supply custom-built factories on 30-year leases. The Salim Group can supply unskilled but nimble-fingered workers (mostly young girls) at \$92.50 (\$54) a month.

With its Prussian efficiency, the growth triangle can hardly fail to impress. However, it is Toytown compared with the mother of all growth triangles—the hinterland of Hong Kong.

If it were not part of China, Guangdong province would be a decent-sized country with a population of 63m. As an economic unit, it has two advantages over the rest of China, and is about to acquire a third. First, its people, the Cantonese, have traded with the outside world for centuries. In Hong Kong and the other outposts of the Chinese world, they are world-class businessmen. Secondly, Beijing's control over its southern provinces has always been haphazard. The main benefit to Guangdong is an ironic one—it was starved of investment during the 1960s and 1970s, which means that today it has far fewer of the grotesquely inefficient state-owned enterprises that are bleeding the rest of China white. Thirdly, in 1997 the remaining artificial barriers will fall between Guangdong and one of the world's best natural harbours, which comes equipped with highly sophisticated trading and financial services: Hong Kong.

Guangdong's emergence began in 1979, when Deng Xiaoping launched reforms which returned control of the land to the peasants. In the next six



years, rural incomes more than doubled in the whole of China. More importantly for Guangdong, Mr Deng made China as open to world trade as any other large developing economy. He created 14 open coastal cities, relaxing restrictions on foreign investment. In addition (and using Singaporean advice), he established five "special economic zones" (SEZs) with added incentives for investors. Three of the SEZs are in Guangdong.

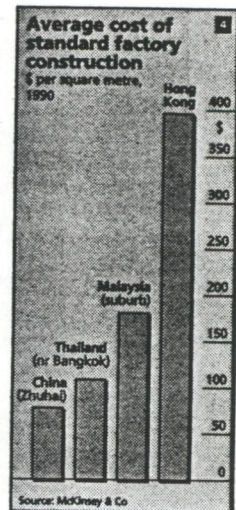
The result has been over a decade of astonishing progress. During the 1980s Guangdong's output grew at an average rate of 13% a year in real terms, meaning the economy doubled in size every six years. Shenzhen, just across the border from Hong Kong, has grown from 100,000 people to over 2m; its output grew by 47% a year during the 1980s.

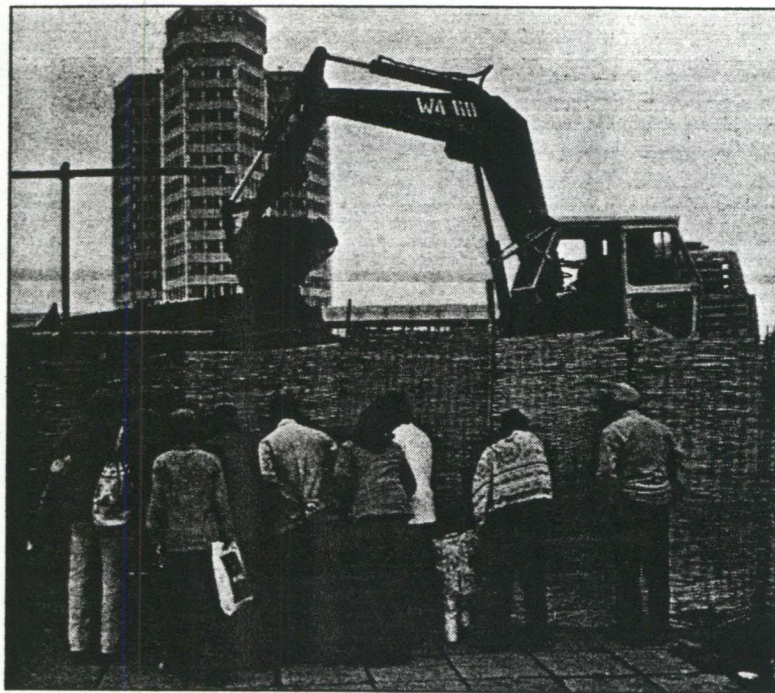
Official Chinese statistics are among the worst in the world. The "gross value of industrial and agricultural output"—China's version of GDP—does not include services. Guangdong's output-minus-services in 1990 were valued at \$44.2 billion. Anyone who has seen Shenzhen yuppies spend more on one dinner than Mr Deng earns in two months will realise that Guangdong's service industries are far more developed than the rest of China's, where the World Bank guesses they account for 20% of GDP. One guess is that Guangdong's GDP is \$78 billion—or \$1,230 a head.

The fuel for Guangdong's boom has been investment by foreign companies. By June this year they had started over 15,000 ventures in the province, at a cost of over \$20 billion. Four-fifths of this money came from Hong Kong companies, enticed by the fact that building a new factory in Guangdong costs one-fifth what it would in Hong Kong. It is also cheaper than it would be in the two obvious alternative sites in South-East Asia (see chart 4). While manufacturing employment in Hong Kong has fallen from 900,000 jobs in the early 1980s to 720,000 now, Hong Kong companies have created over 2m new jobs in Guangdong.

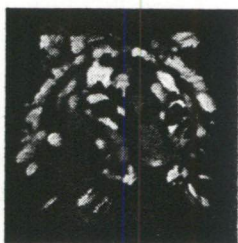
Gordon Wu, an infectiously optimistic Hong Kong businessman, argues that the transformation

First find your hinterland





Leaving the paddy fields behind



of Guangdong has only just begun: "Not many people outside Hong Kong realise yet what Guangdong can manufacture and export. Nor do they realise that Guangdong has the best of both worlds—access to the world market through Hong Kong as well as to the internal market. Give China another 25 years and the whole country can be at Guangdong's level today. By then, Guangdong will be where Taiwan is today, or probably even better."

Hopewell Holdings, Mr Wu's company, is trying to turn this vision into reality. It is in the process of building a six-lane highway through Guangdong. Mr Wu predicts that phase one—the 123 kilometres from Hong Kong to Guangzhou (Canton)—will be open by June 1993, one year ahead of schedule. It will cut the travelling time between the two cities from an infuriating six hours to 90 minutes. Once it is complete, Hopewell will go

on to build a ringroad around Guangzhou and another highway from there to Macau. Guangdong will end up with 305 km of decent road; today it has none. Mr Wu then hopes to build another 500 km of highway from Guangzhou to Hengyang, a town on the Yangtze river in Hunan province. If he can get the finance to build this road, it would be the first modern artery into the interior of China.

Good roads will give Hong Kong's tycoons access to more of Guangdong. This will help to contain labour costs by enabling factories to move away from the Pearl River delta into the province's hinterland. That is an added bonus, but in Guangdong, as in South-East Asia, cheap labour alone is not enough. What gives Guangdong its edge is the quality of its labour. "Friends with factories all over Asia say that Thailand and Malaysia just cannot compare with China. If you need quality and quick delivery, then you have to go to the Pearl River delta," says Kayser Sung, the publisher of *Textile Asia*.

The industrial prosperity is radiating outwards. Neighbouring Fujian has its own centre of growth in Xiamen (Amoy), which has attracted \$3.5 billion in foreign investment, one-third of it from Taiwan, almost visible across the Taiwan Strait. Imagine that the Chinese empire run from Beijing were to disintegrate—Guangdong, Fujian, Taiwan and Hong Kong could form the Republic of Southern China. This new country would have a population of 120m and a combined GDP of roughly \$310 billion, which would put it on a par with Brazil.

Though this may seem unlikely, or at least not imminent, it is next to impossible to predict what will happen in China. Optimists, like Mr Wu, argue that Beijing needs its tax revenues from Guangdong too much to do anything silly. Besides, Guangdong shows the way ahead for the rest of China. The pessimists, many of whom lost everything after the fall of Shanghai, counter that it is impossible to overestimate the communists' ability to kill the goose—and they point to the latest moves in Beijing that show the hardliners strengthening their position. There will be no clear answers until Mr Deng dies and the leanings of his eventual successor become apparent.

The various games of Go

Different styles for different players

SUSTAINABLE and rapid growth that involves pretending political barriers do not exist—the idea of the growth triangles—is not a safe option for Taiwan and South Korea. Using Hong Kong as a conduit beyond their government's restrictions, Taiwanese firms have invested over \$1 billion in China's Fujian province. Formosa Plastics is toying with building a \$7 billion petrochemical complex in Xiamen. The government worries that if Taiwan's companies become too dependent on China, Beijing will enforce its claim that Taiwan is simply a renegade province of the mainland.

In the Korean peninsula, it is probably only a matter of time before the North and South can be reunited. In the meantime, however, their armies are on permanent alert. It makes more sense for

South Korea's *chaebol* to expand into neighbouring Manchuria and Siberia, both rich in resources.

Taiwan and South Korea are societies addicted to growth. To feed their habit they must remain competitive, which means they must turn in on themselves to find solutions for three problems.

First, both countries must ensure that productivity grows faster than real wages. Chart 5 shows how quickly wages rose over the past five years. South Korea's productivity has almost kept up with wages, confirming the strategy of emphasising major industries with economies of scale. In Taiwan, though, productivity has lagged, another sign that the island's small manufacturers have preferred to move their factories to a cheaper country than invest in automation at home.

The second problem is that productivity gains are harder to achieve as products become more complex and their life cycles shorten. Each time the product changes, the machines have to be retooled and the workers retrained. Linked to this is the third problem: in the core technologies of the future, Japanese companies are increasing their lead.

Take liquid crystal display (LCD) screens. Sharp, the industry's leader, expects that worldwide sales of LCD screens, which will be crucial to high-definition television (HDTV), will quadruple to ¥1 trillion (\$7.7 billion) by 1995. It is a market that South Korea's companies are also aiming at. Lucky-Goldstar, South Korea's largest electronics firm until a family feud in its boardroom allowed Samsung to knock it off its perch, has laboratories in America, Germany and Ireland developing its own version of HDTV.

But the would-be imitators face a difficulty. It is relatively simple to hire Japanese and American engineers to "reverse engineer" the Sharp screen. What is not simple is going on to make it. The prototypes for HDTVs rely on two screens only two microns apart, just two ten-thousandths of a millimetre. "To produce LCDs with this level of precision, you need more than one genius. You need teamwork and experience, you need morale. Then you can produce very good LCDs," says the director of Sharp's international business.

The easiest way to make the latest product is to persuade the industry leader to teach you. Though many Japanese companies are notoriously stingy with their technology, others are realising that it may help them to be more open. This was the lesson when Matsushita's VHS standard, given to other manufacturers, triumphed over Sony's technically superior Betamax. Another way is to join with an American company which has the knowledge but not the finance to develop it. Texas Instruments has formed joint ventures with Kobe Steel in Japan, Hyundai in Korea, Canon and the Singapore government in Singapore, and Acer in Taiwan.

But no high-tech company will share its crown jewels with a partner that does not offer something in return. South Korean and Taiwanese companies can offer the world's best-educated workers.

School for success

Confucius wrote, "If you plan for a year, plant a seed. If for ten years, plant a tree. If for a hundred years, teach the people." For a long time his advice was ignored. At the start of the Meiji era in Japan in 1868, only 15% of the population were literate. Compulsory elementary education was introduced four years later and Japan became one of the world's most education-conscious societies. This obsession rubbed off on Japan's former colonies, Korea and Taiwan. After the Korean civil war, the South launched a remarkable drive towards education: almost three-quarters of the cost of building schools, paying teachers, buying books and organising transport was met by parents, not the government. Today, a Korean teenager is more likely to go to university than his Japanese peer; Samsung can rely on recruiting 3,500 graduates a year.

South Korean brainpower is backed by money. Samsung's electronics subsidiary spends 8% of its annual sales revenue on research and development. The other *chaebol* would lose face if they

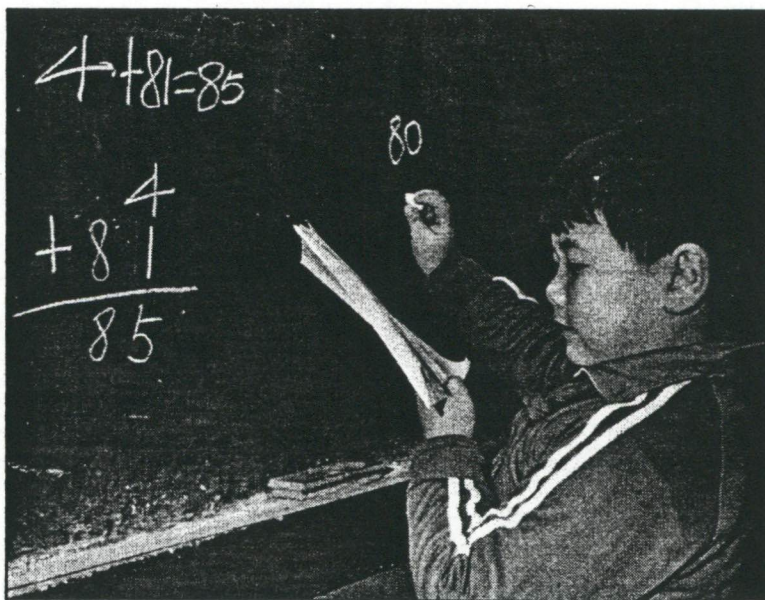
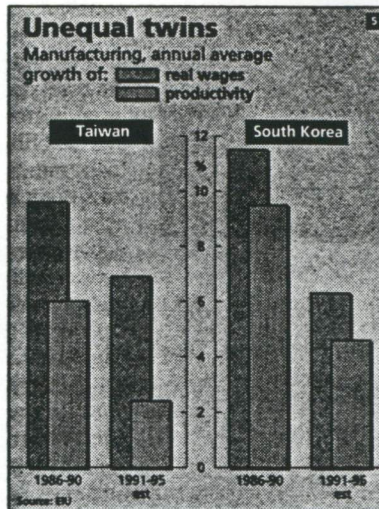
spent much less. R&D spending for the country as a whole has risen from 1% of GDP in 1980 to slightly over 2% in 1990. The government's target is 5% of GDP by 2000.

Taiwan's achievement is even more impressive. It has 42 universities and 75 polytechnics, which between them turn out 37,000 engineers and 136,000 technicians each year. One in every four candidates for doctorates in electrical engineering at American universities is from Taiwan. The island's brain drain has been reversed. Rather than work in Silicon Valley, the American-trained engineers are coming home—even though basic salaries in Taipei are half what they can earn in America. Some hope it will be easier to start their own company in Taiwan; many simply want their children to grow up in a Chinese environment.

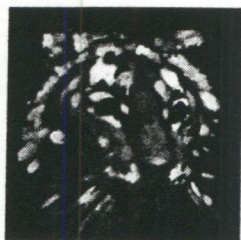
In some fields Taiwanese companies are no longer following technology, they are leading it. The communications equipment on George Bush's motorboat is made by Microtek International, a Taiwanese firm. Sony, Sharp and IBM have all set up R&D centres in Taiwan, to pick local brains.

The biggest technology leader is Acer Computer, started in 1976 by Stan Shih and four friends, with \$25,000 in savings. To raise more capital, they insisted that the original employees buy shares in the company. Today, over 100 of them are (American-dollar) millionaires and Mr Shih is much richer. Acer's strength is its 800 engineers. In 1986 they launched the world's second 32-bit personal computer, ahead of IBM (Compaq was first).

Mr Shih is a keen player of Go, a complex game played on a 19-by-19 grid. The object is to gain territory from the enemy. The successful go-master rarely attacks head on. He probes the enemy's weak positions, ignoring his strongholds. Once this stage (called *bu ju*) is finished, the final battle (*zhong*



Planning for a hundred years



pan) can begin.

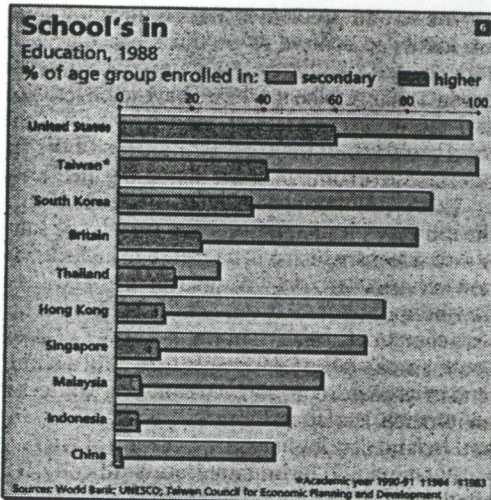
Acer's name in Chinese is Hong Chi, which means "grand game of go". Mr Shih reckons that the company's *bu ju* is complete. It has developed its own products, as good as anyone's. Its sales are over \$1 billion. It has formed alliances with Texas Instruments, with Daimler Benz's microelectronics subsidiary and with Smith Corona. It has offshore manufacturing plants in Malaysia and Holland. A rights issue at the peak of the Taipei stockmarket's boom reinforced its capital base. Only one thing is missing before the *zhong pan* can begin. Acer, like most other successful Taiwanese and Korean companies, has no experience of marketing.

Think of an Asian brand name. Now think of one that is not Japanese. It is hard: most Asian companies start as original equipment manufacturers (OEM), making products that are sold under someone else's name. Thus four-fifths of the pocket calculators bearing the Casio brand are made by Cal-Comp, a Taiwanese company which is the world's biggest maker of pocket calculators.

There is a lot to be said for OEM as a means of getting started. It is the harshest industrial training school there is. If Casio is to buy your calculators, they must be the best and cheapest on the market. But the day eventually dawns when an OEM producer knows he must develop a brand name if he is ever to join the big league. And this is where it gets cruel: western consumers do not care where the insides of their latest gadget are made as long as there is a nice familiar name, like IBM, on the case. They steer clear of anything that says "made in Taiwan".

Mr Shih hopes Acer will be the Sony of Taiwan, making "made in Taiwan" a symbol of quality. With the backing of the government, he has founded a Brand International Promotion Association in Taipei. Last year Acer paid \$94m for Altos, a Silicon Valley firm, to improve its distribution in America. Many of Mr Shih's domestic competitors think he is a fool to spend so much. They will probably turn out to be wrong.

The *chaebol* are taking a similar route to Mr Shih's, but with mixed results. Hyundai learnt the painful way that a half-baked brand is worse than



no brand at all. Its attempts to sell computers under its own name in America left consumers confused by what a maker of unglamorous cars was doing in the computer market. Samsung, with characteristic chutzpah, is aiming to put its name on every baggage trolley in every airport in the world, in order to develop its brand image. Daewoo has recently taken over Leading Edge, the Boston-based distributor which did well at marketing the first generation of IBM-clone personal computers (made by Daewoo) and then faded. Daewoo has no illusions about its products—they are not at the leading edge of technology. It aims to start piling them high and selling them cheap under the Leading Edge brand name, in discount stores like Walmart and Sams. It is far from clear that this strategy will be any more profitable than selling OEM products.

The best companies in Taiwan and South Korea are only six-nine months behind their Japanese rivals in working out how to manufacture many products, but 10-15 years behind when it comes to marketing them. This means that Japanese companies are safe for the rest of this decade. And beyond that? "Eventually they will catch us up—of this I am sure," says Sharp's international director.

The problems of success

Asia's winners
must go back to
the basics

SO FAR this has been a survey of almost unrelenting optimism. Now for three doubts. None is insurmountable. But, if they are not dealt with, the tigers will lose the spring in their prowl and the second generation of emerging economies may forfeit its chances of reaching the next stage.

The first is a problem of success: growth has overwhelmed the infrastructure. Few governments have the effrontery to ask for taxes to rebuild a country's transport system just in case its economy doubles in size over the next decade. The exception is Singapore, whose government has never flinched from acting long before the need is apparent. Thus, Singapore is one of the few cities in emerging Asia with traffic that moves; its eerily efficient Changi airport sometimes seems almost deserted.

Contrast that with Hong Kong, where Kai Tak

airport is so overburdened that airlines have to send their aircraft to Manila overnight to find parking space. Or with South Korea, where 600 new cars roll on to Seoul's streets every day. Kim Jong Gie, the director of planning at the Korea Development Institute, estimates that the government will have to spend at least \$10 billion a year on infrastructure between now and 1996 just to stop things getting worse. Mr Kim would rather not think about the possible cost of rebuilding the North.

All these sums are dwarfed by Taiwan's. Its government says—with an ambition that strains belief—that it will spend NT\$8 trillion (\$302 billion) over the next six years on upgraded ports, new airports, superhighways and high-speed trains. The doubts concern not so much money, as will.

In the tigers, as well as in Indonesia and Malay-

sia, the will is there and things are moving. The Chinese government does not have the money to do much and would not use it to help the southern provinces if it did. But it does not seem to mind letting people like Mr Wu do the job for it. The same cannot be said of Thailand. Mr Wu would like to build a mass-transit system in Bangkok, where traffic now moves at an average speed of less than 8 km an hour. His proposal has joined a dusty pile of other plans for mass-transit systems, some of them now 12 years old. It is impossible to quantify how much foreign investment Thailand has already forgone because of its over-burdened infrastructure, but future growth will clearly be hostage to improvements in the country's physical condition.

The second problem is also a by-product of success, but it is harder to solve. Asia's industrial revolutions have been the fastest ever; they have also been the dirtiest.

Laundering the profits

There were two environmental lessons that Asia's emerging economies could have learnt from Japan's experience. The first is that you can go hell-for-leather for growth and worry about cleaning up the pollution once you are rich. The second lesson is the gospel as now preached by the Keidanren, Japan's powerful industrial lobby: it can be 100 times cheaper to prevent the muck from coming out of the pipe than cleaning it up once it has.

Sadly, most of emerging Asia has chosen to learn the first lesson. (Once again, Singapore is the exception. It went green years ago.) Taiwan's limit on emissions of sulphur dioxide by factories is 750 parts per million, five times the limit applied in Los Angeles.

Until recently, South Korea and Hong Kong were not much better. As a result, vocal environmental lobbies have sprung up in all three countries. One effect of their pressure has been an effort by industry to shift its dirtier processes to countries that do not ask too many questions. The Thailand Development Research Institute recently looked at investment applications by foreign firms whose activities would produce significant amounts of hazardous waste. Between 1987 and 1989 such applications rose from 25% of the total to 55%. The institute calculates that the country now produces 2m tons of hazardous waste a year, and forecasts that this will triple by the turn of the century.

Thailand's problems will be dwarfed by the environmental consequences of China's rapid growth. China relies on low-quality coal for three-quarters of its power. It is already the world's fourth-largest producer of greenhouse gases (after America, the Soviet Union and Brazil). Pity the ozone layer once all 1.2 billion Chinese can afford CFC-using fridges and air-conditioners.

History suggests that during industrial revolutions people will tolerate horrendous living conditions as long as they feel their lot is improving. What the governments of Asia's emerging economies should not forget is that it is the poor who suffer most from pollution. If they start to suspect, for whatever reason, that they are not benefiting from growth, the social stability on which economic growth depends could disappear.

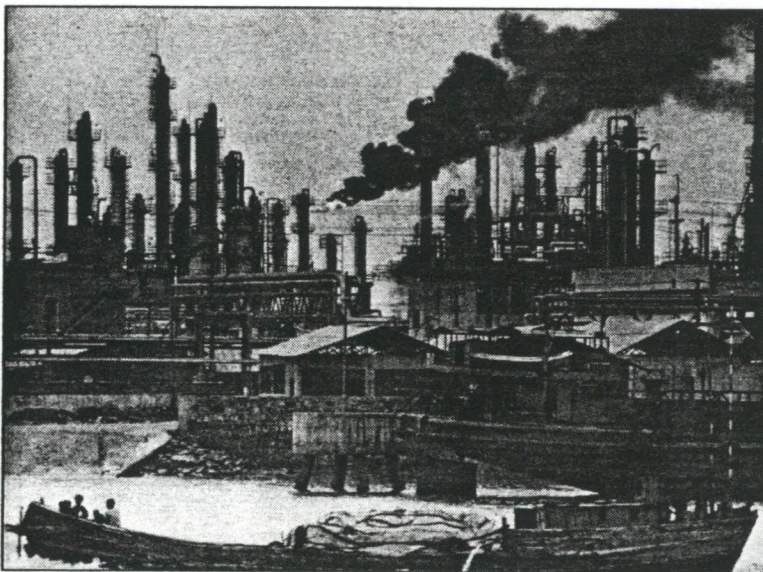
The third doubt is financial. Chart 1 showed

that all of Asia's emerging economies have savings rates significantly higher than the average for members of the OECD. The question is how efficiently these savings are channelled. The paradox is that the region's most dynamic economies have the most primitive financial systems.

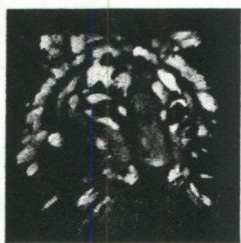
This applies particularly to South Korea and Taiwan. Credit has been the fuel of South Korea's growth. The biggest *chaebol* are massively indebted: Samsung's electronics subsidiary, for example, took on debt equal to seven times its equity in order to finance its push into semiconductors. The industrial planners' main lever of control has been their ability to direct cheap credit to the borrowers they favour. Current-account surpluses in South Korea between 1986 and 1989 gave the government a chance to overhaul the country's financial system; but the technocrats would not give up their source of influence, and the current account has since slipped back into deficit. One result of this failure to reform is that big and small companies are forced to rely on the "informal" market for much of their short-term finance. A financial executive of one of the larger *chaebol* was unable to start an interview until he had rounded up some overnight cash, for which he had to pay 23%.

Taiwan's companies are less willing to borrow—in part because of a Chinese dislike of debt, in part because the island's banks will not normally lend to small and medium-sized companies. The competition for cash in the informal market is harsh: "It's just like the Serengeti—only the fit survive," says one banker. Until early 1990 the stock-market was one way for small, fit companies to finance expansion—helped by spectacular speculative excess. On at least one day in early 1990, turnover in the Taipei market was greater than that on the Tokyo and New York stock exchanges combined. Then the bubble burst. Taipei's punters are an "ignorant, credulous and unsophisticated bunch," says one snippy investor in Hong Kong.

Taiwan's version of the stockmarket as casino has caught on elsewhere. In the first half of this year it was quite normal for half the turnover on Bangkok's exchange to be trading in the shares of stock



Still time to avoid a blighted future



To become rich is to become unafraid

brokers, who make their profits from trading in shares. In Jakarta there are twice as many registered stockbrokers as there are listed companies.

The governments involved must perform the delicate balancing act of continuing to liberalise

their financial systems, while at the same time introducing effective regulation. Until they do this, Hong Kong and Singapore will retain their traditional roles as bolt-holes for much of the region's spare cash.

Threats abroad, opportunities at home

WHAT would happen to Asia's emerging economies if the United States took shelter behind protectionist walls? For all their bluster, American politicians cannot forget that America needs Japan's capital and that their voters like Japanese gadgets. Emerging Asia is a much easier target than mature Japan. In the last presidential campaign, it was a Hyundai car from South Korea that drew Richard Gephardt's greatest ire.

East Asia was the great beneficiary of Reaganomics; its trade surpluses mirror America's trade deficit. America is the largest single market for the exports of each of Asia's emerging economies. Hong Kong's reliance on the American market has actually increased. Greater protectionism in America would be a disaster for emerging Asia.

Or would it? Measures designed to restrict Asia's most competitive exporters have often had the opposite effect. Voluntary restraint agreements (in reality anything but voluntary) placed on the export of Japanese cars to America handed windfall profits to Japanese producers, because demand then comfortably exceeded supply. The notorious Multi-fibre agreement, which for the past 31 years has rigged world trade in textiles and clothing has become a source of competitive advantage for the Hong Kong producers it was meant to hit. Its quota system gives them a degree of protection against lower-cost producers.

But if Congress lost its senses and reintroduced Smoot-Hawley protectionism, even Asia's wildest exporters would have a hard time turning this to

their advantage. The remote threat that this could happen has had one positive effect: it has forced Asia's emerging companies to realise that there is a whole world they have barely touched.

In the late 1980s the acid test for most companies from the four tigers was whether they could sell in the American market. They read about Europe's plans for 1992, but tended to see Europe as a tricky place, best ignored. Now, however, Taiwanese and South Korean sales teams are combing Europe, including Eastern Europe, for opportunities. South Korea's government has offered the Soviet Union \$3 billion in tied aid, in the hope that Korean firms can seize market share before the Japanese go wading in. Nor is Europe the only area of interest. Daewoo Telecom has signed a contract to provide 20,000 fax machines and several hundred telephone exchanges to Iran.

The wealth next door

The biggest new market, however, is not exotic at all; it is right next door. Emerging Asia is the world's fastest-growing consumer market.

Two factors are driving the market's growth. The first is the rise in earnings. The second is demography. In Asia's emerging economies life expectancy is rising while infant mortality is dropping. As the number of young adults as a proportion of the whole population increases, so does the number of households. South Korea had 8.1m households in 1980; it will have 14.7m by 2005. Most of these new households will be in the cities. In Thailand, Indonesia and Malaysia, the population of the large cities is growing at 3½-4% a year, while the rural population remains unchanged.

Because there will be more urban households and smaller families, with both parents working, the structure of consumer demand will be transformed. There will be a housebuilding boom, followed by a sharp rise in demand for consumer durables, particularly for labour-saving things like washing machines and microwaves. An urban middle class will want more ways to pass its leisure time, so expect to see the world's biggest Disneyland somewhere in southern China by the early 21st century. It will also want better education for its children, and better health care for the growing number of old people.

This opportunity also presents companies with a problem. They need to establish a foothold before each market is established, but that means tackling markets that are mostly too small to be profitable.

There are, however, three factors that are making it much easier to tackle emerging Asia's markets. First, Asian consumers are among the most brand-conscious in the world. This creates a rare opening for western companies with strong



Driving the growth in the consumer market

brands. Mercedes, BMWs and Volvos are the only non-Japanese cars commonly seen in Asian traffic jams, and they are getting more common. Johnny Walker chose Thailand as the first country in the world to launch its Blue Label whisky, which is distinguishable only by the colour of its label and a price ten times higher than Black Label. McDonald's already has 59 restaurants in Hong Kong.

Second, Asia's rich consumers are becoming more accessible. Most urban households own a television. Satellite technology is weakening governments' grip on broadcasting, which as a result is becoming more commercial. Earlier this year a joint venture between Hutchvision, controlled by Li Ka-shing, China's CITIC and Cable & Wireless, a British telecommunications company, launched AsiaSat 1. The satellite's footprint covers 2.7 billion people from Tehran to Taipei. Star TV will be beamed free into any home with a dish.

At the same time, retailing is getting much more sophisticated. Japanese chains like Isetan, Sogo and Seibu are leading the way. Yaohan has gone the furthest. In Japan it is a medium-sized chain of supermarkets. Kazuo Wada, Yaohan's idiosyncratic founder, decided that land prices in Japan made the cost of expanding there prohibitive. So he moved his head office and family to Hong Kong three months after the Tiananmen Square massacre ("Rents were cheap then," he explains). He opened his first Chinese store in Shenzhen two months ago, and is now negotiating to build the biggest store in Asia in Pudong, a massive new development in Shanghai.

Mr Wada has few illusions about China. Its government is a nightmare to deal with, he says, and

only the Special Economic Zones are ready for slick retail operations; "the rest of the country will not be ready until the next century." In the meantime Mr Wada is concentrating on establishing reliable suppliers in China and opening more stores in the expanding suburbs of South-East Asia.

The third factor that is making Asia's consumer markets more accessible is probably the most important. The barriers which have until now hobbled intra-Asian trade are being dismantled. This makes it possible for producers to start thinking about tackling several markets from one base, rather than going through the laborious process of establishing a factory in each market.

At the moment Hong Kong and Singapore are the only emerging Asian economies which are practising free trade, although the others are now moving in the right direction. By the end of 1990 Taiwan had cut its average tariff to 5.8%. It aims to reduce it to 3.5% by 1993. South Korea's target for 1993 is 7.9%. Last year Indonesia cut tariffs on 2,500 imports and removed 370 non-tariff barriers. Anand Panyarachun, Thailand's prime minister, has come up with an interesting proposal to turn the Association of South-East Asian Nations (ASEAN) into a free-trade area.

The demolition of the still-high trade barriers within Asia would give added impetus to the already rapid growth of intra-Asian trade. And, if past trends are a guide, Japan will eventually replace America as the world's biggest market. These two factors mean that Asia's emerging economies will be away, on a self-sustaining cycle of growth. Not much can stop them then; except, perhaps, politics.



A question of government

THIS survey has deliberately left politics to the end, in part because that is where most Asians would put it; in part because the political lessons to be drawn from the emerging economic powers of Asia are the most sobering.

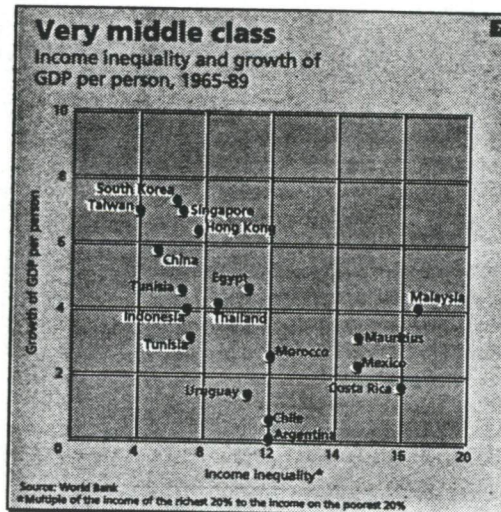
Over the past quarter of a century of dazzling growth, there has not been a transfer of power to another political group in any of the eight economies. China remains a communist dictatorship. Singapore, Indonesia and Malaysia have each been ruled by the same authoritarian party since achieving independence. South Korea and Taiwan have begun to liberalise, but for the time being are still run by the old guard. Hong Kong is a colony. Thailand appears to be an exception, but is not really. While its generals and civilian politicians take it in turns to govern and to serve as a disloyal opposition, a small group of technocrats rules the country. This group's first loyalty is to the king, who gives stability to the nation.

Is the lesson, then, that it is only possible to double the size of an economy each decade with an authoritarian government at the helm? Not necessarily. What has made emerging Asia's governments exceptional is that they have been economically enlightened.

Many Asian businessmen would define

enlightenment in one word: stability. Asia's strong governments have rarely flinched from taking tough measures to maintain macroeconomic stability. Just as important, they have ensured that economic policies are predictable. At the same time they have kept their economies in shape through controlled exposure to international competition.

The challenge for politicians





This enlightenment begs another question: how have small cliques of unelected technocrats managed to keep the common good in view while not succumbing to what Adam Smith called the "clamorous importunity of partial interests"? Chart 7 suggests an answer. They have combined growth and equality. Relatively equal incomes give people a common bond and sense of destiny.

The chart shows the gulf between emerging Asia and Latin America, measured by rate of growth and income inequality. Over the past quarter of a century most Latin American countries tried to foster domestic industry by protecting it from competition. This protection was often paid for by discriminatory taxes on farming, thus impoverishing farmers. Asian governments realised, in the words of Lee Kuan Yew, that they "must create an agricultural surplus to get their industrial sector going." Rich and industrious rice-farmers have been the foundation of Asia's industrialisation.

In Japan, South Korea, Taiwan and China, investments to make farming more productive were accompanied by radical land reform. The link with income equality is self-evident. The Philippines' failure to introduce serious land reform is the main reason why it is the sick man of South-East Asia and not an emerging economy.

The challenge of change

The example of the Philippines shows how hard it is to implement land reform, except in the aftermath of war or revolution. There are easier ways to encourage the even spread of wealth; none matters more than education. A study carried out in Malaysia found that one extra year of schooling increased a man's wages by an average of 16% and a farmer's output by 5%. Indonesia has just made a painful transition from being an oil-dominated economy to one led by industry. During the transition, its government cut capital investment, but it maintained its current spending on education and other basic social services. The most impressive consequence was that the poor's share of GDP actually increased during a difficult period of adjustment.

Reprints

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Tel (212) 541-5730
Fax (212) 541-9378



A more demanding voter

For the second generation of emerging economies, making sure the poor benefit from growth is vital. They are larger countries than the first generation, and less racially homogeneous. In Indonesia and Malaysia, there is an endemic risk of a backlash against Chinese businessmen when things do not go quite so well. In Thailand average household incomes in Bangkok are ten times higher than they are in the north-east, where one-third of the population lives. The widening gulf between the prosperity of China's coastal provinces and the poverty of its interior will inevitably cause political tension. That is why, despite the potential of the Hong Kong-Guangdong economy, many of the colony's brightest will continue to leave—along with an estimated \$3 billion of Hong Kong money put each year into Vancouver's banks and property.

The other three tigers—Singapore, South Korea and Taiwan—are facing a different set of political problems. To get to the next stage, their businesses need a well-educated, flexible workforce—people who will be more politically demanding. But will the old guard be willing to loosen its grip?

In Singapore, Lee Kuan Yew stood down towards the end of 1990 after 31 years as prime minister, handing power to his appointed successor, Goh Chok Tong. Mr Lee remains in the cabinet as senior minister without portfolio; his son, Lee Hsien Loong, serves as deputy prime minister. Mr Goh called an election at the end of August in an effort to win his own mandate, but ended up losing an unprecedented four seats to the opposition (out of a total of 81 seats). Some observers therefore assume that the Lees, père et fils, will take back the reins of power. Even so, Singapore's road to political liberalisation is likely to remain one-way.

The same is true in Taiwan and South Korea. In the mid-1980s Taiwan's President Chiang Ching-kuo began to prepare for the end of martial law and for a freer electoral system. Its parliament has since become famous for its televised fisticuffs. Yet these are positive signs of the vigour of Taiwanese society and of its increasing openness. No one has taken the trouble to learn the rules of polite political exchange yet, but they will.

South Korea is facing three rounds of national elections next year. Although there could be an upset, President Roh Tae Woo is expected to win all three. What matters is that the result will have been decided not in an army barracks but by the Korean people. The fact of most Koreans' daily lives is that their civil liberties are now respected, not infringed.

Over the past quarter of a century, the governments of emerging Asia have based their claim to popular support on their ability to sponsor, or at least to preside over, a rapid increase in prosperity. This is unlikely to change as they move from authoritarianism towards democracy. Asian businessmen exude self-confidence. Those who worry about their leaders' ability to keep up with change can always seek solace in the words of an observer of the first industrial revolution, Adam Smith: "Though the profusion of government must undoubtedly have retarded the national progress of England towards wealth and improvement, it has not been able to stop it."

"Document Control"

TYPE: INFORMATION DOCUMENT NUMBER: 9124978
ORIGINATOR: 02 STATUS C DIRECTORATE STATUS

FROM: MURRIN, Thomas J.: DUQUESNE UNIVERSITY

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 11/22/91

SUBJECT: HE IS PROVIDING DR. BROMLEY WITH A COPY OF HIS
BIOGRAPHY AS WELL AS CURRENT PHOTOS.

DIRECTORATE STAFF
ASSIGNED: ASSIGNED:

ACTION STAFF
REQUIRED: ACTION:

SENDER'S DUE DATE:
OSTP DUE DATE: STAFF DUE DATE
DATE COMPLETED: DATE COMPLETED/DEPT:

COPIES TO: D. Allan Bromley
PCAST

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OSTP RECEIVED: 12/03/91 DEPT RECEIVED:
FILE: P-PCAST
CENTRAL FILES:



THOMAS J. MURRIN
DEAN
SCHOOL OF BUSINESS
AND ADMINISTRATION

Of Interest . . .

4978

THOMAS J. MURRIN

RECEIVED
JAN 17 1991
U.S. DEPT. OF COMMERCE

Thomas J. Murrin was named Dean of Duquesne University's A.J. Palumbo School of Business Administration; effective January, 1991 --- after serving for 18 months as Deputy Secretary of the U. S. Department of Commerce; nominated by President George Bush and confirmed by the U. S. Senate.

At the Department of Commerce --- with its approximately 40,000 people and an annual budget of about \$3 billion --- Murrin was deeply involved in a variety of executive activities including the 1990 Decennial Census; the Malcolm Baldrige National Quality Award; the Modernization of the National Weather Service; the new Advanced Technology Program; oversight of the Patent and Trademark Office; and --- through the International Trade Administration and the Export Administration --- important relations with dozens of nations around the world.

As "Acting Secretary" for Commerce Secretary Mosbacher, Murrin attended Cabinet and other top level meetings with President Bush, Vice President Quayle or other senior Federal Government executives. Murrin was appointed by President Bush to chair the Commission on the Federal Appointment Process; was selected to chair the Federal Quality Institute; was appointed chair of the Interagency Committee on Technology and Industry and was selected for the NASA Advisory Council, and the Manufacturing Forum of the National Academies.

Since returning to Pittsburgh, he has continued his participation on the NASA Advisory Council and the Manufacturing Forum --- and President Bush has appointed him to be a member of the President's Council of Advisors on Science and Technology (PCAST). Also, Tom has been selected for the Executive Committee of the Council on Competitiveness. He has joined the Board of Directors of Motorola --- and of the Duquesne Light Company.

Recruited to the Westinghouse Electric Corporation as a graduate student in 1951, Murrin initially worked as a manufacturing/materials engineer. Over the next 36 years, he served in various positions with Westinghouse --- including European Manufacturing Representative based in Geneva, Switzerland; corporate vice president of Manufacturing; senior vice president of the Defense and Public Systems Group; and president of the Public Systems Company.

Murrin retired in 1987 as president of the firm's Energy and Advanced Technology Group --- an organization with nearly \$5 billion in annual sales. In that capacity from 1983 through 1987, Murrin was responsible for Westinghouse's worldwide operations in defense and aerospace systems; electric energy systems; and people-moving systems. He was a member of the Westinghouse Management Committee --- the top policy-making body of the corporation --- from 1974 until his retirement. Quality and productivity improvement were elevated as key corporate concerns under his guidance. During his career, he travelled to more than 40 countries.

Building on his extensive foreign travel and study of industrial operations overseas, Murrin served as a U. S. delegate to the NATO Industrial Advisory Group; headquartered in Brussels, Belgium. He was a member of the Defense Policy Advisory Committee on Trade (DPACT) of the Department of Defense and served as chairman of DPACT's Subcommittee on Trade Relations with Japan.

He was the first chairman of two private sector advisory committees to the Federal Government: the Board of Overseers of the Commerce Department's Malcolm Baldrige National Quality Award, and the Defense Department's Defense Manufacturing Board. Murrin was a member of the President's Commission on Industrial Competitiveness --- and was chairman of the Board of Governors of the Aerospace Industries Association.

Murrin has often been invited to speak and write during recent years --- particularly on Global Competitiveness and Quality and Productivity Improvement. During 1990, he made over 50 such presentations --- and several of these have been published. In 1991, he has continued to give numerous talks --- to Business, Government and Academic audiences; to be interviewed on TV and Radio shows; and to write about related topics.

During his earlier involvement with educational institutions, Murrin served as Distinguished Service Professor of Technology and Management at Carnegie Mellon University. He was Chairman of the Board of Trustees of Duquesne University; a member of the Board of Trustees of Fordham University; and served on the national board overseeing "Cities in Schools."

As part of Murrin's community service activities in Pittsburgh, he led a successful fund-raising effort at Mercy Hospital, where he was chairman of the Board for nine years --- and participated in similar efforts at Duquesne University and for United Way Drives.

Murrin is currently involved in many "pro bono" activities --- and, as examples, is the Honorary Chairman of the 1992 fund-raising Dinners for the Vocational Rehabilitation Center --- and for research on Cystic Fibrosis.

Murrin's honors include: Order of Merit, Westinghouse Electric Corporation (1968); Annual Achievement Award in Business, Fordham University (1976); National Leadership Award, American Productivity Center (1981); James Forrestal Memorial Award, National Security Industrial Association (1983); Election to the National Academy of Engineering (1985); Manufacturing Management Award of the Society of Manufacturing Engineers (1986); Hall of Fame, Cardinal Hayes High School (1988); Honorary Degree of Doctor of Management Science, Duquesne University (1989); and Excellence in Manufacturing Award, National Security Industrial Association (1989).

A native of New York City, Murrin received a bachelor of science degree in physics from Fordham University in 1951 where he was a starting tackle under Coach Vince Lombardi; has done graduate work at several universities; and is a fellow of the National Academy of Engineering. He was born April 30, 1929, and is married to the former Dee Coyne of New York City. The Murrins have eight children.





"Document Control"

TYPE: INFORMATION DOCUMENT NUMBER: 9124884
ORIGINATOR: 02 STATUS C DIRECTORATE STATUS

FROM: GOOD, Mary L.: NATIONAL SCIENCE BOARD

TO: PRESIDENT BUSH

DATE OF
CORRESPONDENCE: 11/13/91

SUBJECT: RE: HER RESIGNATION FROM THE SCIENCE BOARD IN ORDER
TO ACCEPT AN APPOINTMENT TO PCAST.

DIRECTORATE STAFF
ASSIGNED: ASSIGNED:

ACTION STAFF
REQUIRED: ACTION:

SENDER'S DUE DATE:
OSTP DUE DATE: STAFF DUE DATE
DATE COMPLETED: DATE COMPLETED/DEPT:

COPIES TO: D. Allan Bromley
PCAST

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REMARKS: PHONE: EXT:

OSTP RECEIVED: 11/22/91 DEPT RECEIVED:
FILE: P-PCAST
CENTRAL FILES:



NATIONAL SCIENCE BOARD

1800 G Street, NW
WASHINGTON, D.C. 20550

4884
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91 NOV 22 P 3: 42

OSTP
MAIL ROOM

November 13, 1991

The President
The White House
Washington, DC 20500

Dear Mr. President:

You have indicated your intention to appoint me to serve on the President's Council of Advisors on Science and Technology. I am pleased to have the opportunity to work with you and Dr. Bromley on PCAST. However, to serve in this new position, it is necessary for me to submit my resignation to you as a Member and Chairman of the National Science Board. Please accept this resignation as of today.

It has been a great pleasure and a privilege to sit on the National Science Board for the past eleven and one-half years. It has been an exciting time for science and technology. I look forward to continuing this quest for the best utilization of our science and technology base in the Nation's interest through PCAST.

Respectfully submitted,

Mary L. Good

MLG/jr

cc: Dr. A. Bromley, Special Ass't. to the President ✓
Dr. Walter Massey, Director NSF
Dr. Tom Ubois, Executive Officer NSB

"Document Control"

TYPE: INFORMATION DOCUMENT NUMBER: 9124739
ORIGINATOR: 02 STATUS C DIRECTORATE STATUS

FROM: LIKINS, Peter: LEHIGH UNIVERSITY

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 11/05/91

SUBJECT: RE: THE PCAST REPORT TO THE PRESIDENT. HE SUGGESTS
PERSUADING THE PRESIDENT TO GO BEYOND MEETING THE
NATIONAL EDUCATION GOALS.

DIRECTORATE STAFF
ASSIGNED: ASSIGNED:

ACTION STAFF
REQUIRED: ACTION:

SENDER'S DUE DATE:
OSTP DUE DATE: STAFF DUE DATE
DATE COMPLETED: DATE COMPLETED/DEPT:

COPIES TO: D. Allan Bromley
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Tom Ratchford

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Lehigh University



Peter Likins, President

Alumni Memorial Building 27
Bethlehem, Pennsylvania 18015
telephone (215) 758-3155

RECEIVED

NOV 12 P 5: 01

November 5, 1991

OFFICE OF THE
DIRECTOR

MEMORANDUM

To: D. Allan Bromley

From: Peter Likins, PCAST Panel on Education and Human Resources

Subject: Report to the President

Preface

In December of 1990 the PCAST communication with the President focused on strategies for achieving the National Education Goals as they relate to science and mathematics. As we approach the anniversary of this communication, we are preparing a message designed to persuade the President to go beyond meeting the National Education Goals in order to meet the nation's requirements for scientists, mathematicians, engineers and technologists.

Before preparing a message for the President, it seems appropriate for the panel to draft a more comprehensive statement for the consideration of the full PCAST membership. If this memo meets with your approval, you may wish to distribute it to the PCAST membership for a discussion that might lead to a charge to draft a corresponding memorandum from PCAST to the President.

In our 1990 communication with the President, it was possible to deliver our message by reinforcing his previously declared commitments. Now we want to move him another step in the same direction, and that won't be so easy. Our task is complicated by the realization that we require now a two stage process, and experts disagree about the comparative importance of the first and second stages.

The first stage response is to meet the challenges of basic education in science and mathematics for everyone, as required by the National Education Goals. (We will have more to say about how strategies for achieving these goals can benefit future scientists, mathematicians, engineers and technologists.)

The second stage response that we will request of the President relates to the need to nurture the talents of children who demonstrate early in life a special aptitude for science and mathematics. It serves the nation's interests to give these children something more than the standard fare designed for all students alike. Such students are by definition relatively few in number, and their needs can be met with modest costs in financial terms. But the political costs of elitism in America can be formidable, and daunting even to our "education president."

The Basic Issues

Learning in any discipline is the product of both talent and effort, all would agree. But there are diverse opinions regarding the relative importance of talent and effort. This diversity of opinion divides the experts consulted by the panel, and it separates national cultures.

In the USA, the cradle of democracy, we tend to accept to an unusual degree the genetic aristocracy implied by the premium we place in any field on natural talent, as opposed to ability developed through hard work. In Japan the opposite cultural norms prevail; everyone is expected to achieve at a high level by working as hard as required to achieve the goal.

Evaluating the comparative importance of talent and effort in learning is a research task, not subject to resolution through debate and persuasion without empirical evidence. Even in the presence of this uncertainty, however, policy judgments must be made.

In making policy judgments, we must recognize behavioral consequences. If we err in the direction of relying on talent for learning, we discourage effort. If we err in the direction of relying on effort, we encourage humility and stimulate everyone to work harder, even if that leads at times to frustrated expectations.

It seems obvious that policy makers have an obligation to set policies in the presence of this uncertainty on the basis of premises that stimulate effort from teachers and students, while concurrently supporting research to reduce the uncertainties in the learning process.

Stage One: Meeting the National Education Goals

The national debate on education reform is gradually producing something approaching consensus approval of the following process:

- (1) Set National Education Goals.
- (2) Set National Education Standards, defining learning standards to be achieved nationally, field by field.
- (3) Develop a national system of examinations designed to measure performance and achievement of the National Education Standards. It seems unlikely that a single national examination will emerge from this process, but a set of nationally approved "reference examinations" would be devised as standards against which alternative examinations would be "calibrated." In this way local preferences would be respected and a continuing evolution of tests would be encouraged.
- (4) Develop a wide variety of responses to the challenge of educating American children to enable them to demonstrate through the examination system that they meet the National Education Standards. Ideally, every teacher in every school will be

challenged to find new ways to meet this objective for every child. There would be no "national curriculum."

- (5) Use small-sample statistical measurement instruments (such as those developed by the NAEP) to compare groups nationally and internationally.

Progress is being made in advancing each of the five steps noted above. The National Education goals have been set by the President and the Governors. National Education Standards have been proposed by the President in the form of "New World Standards," and developed in certain fields (such as the Mathematics Standards adopted by the National Council of Teachers of Mathematics). Standards proposals are also being developed in the sciences (with the sponsorship of the National Research Council and other nongovernmental bodies). Official standards will ultimately be adopted by the Standards Council under the direction of the National Education Goals Panel.

The development of the national system of examinations in Step #3 is also underway. The MacArthur Foundation and the Pew Charitable Trusts have financed the early stages of the New Standards Project, which is directed currently toward the development of reference examinations and calibration procedures in Mathematics and English. It is essential for the national plan that this work go forward, and corresponding efforts are required in the basic sciences.

Once Step #3 is accomplished in accordance with this plan, all the national bodies are expected to get out of the way and let the teachers teach. The statistical measurement instruments developed in Step #5 should be able to confirm the validity of the national system of examinations in Step #3 as indicators that National Education Standards have been met.

This entire process differs from established practice in American basic education in the new presumption that virtually all students who work hard enough with qualified teachers will be able to meet world class standards. There seems to be little doubt that adopting this new premise constitutes an improvement in educational policy that will serve virtually all Americans, including those who will ultimately become our scientists, mathematicians, engineers and technologists. One might well wonder, however, if these new policies will be sufficient for this special population.

Stage 2: Achieving Our Full Potential for Excellence

Abundant evidence supports the proposition that not all mathematicians are created equal. However important effort may be to the achievement of the full developmental potential of any individual, it can hardly be denied that significant differences may be found in natural talent for mathematics, science and engineering, whether measured in early youth or in fully developed maturity. Some people in this world seem to be born with special aptitudes in these fields, and society is best served if these capacities are fully developed through education and experience.

We must ask the question: If we pursue the plan to meet the National Education Goals, will this strategy optimize the likelihood that children with special aptitudes in scientific fields will be identified and properly nurtured in their development? If an affirmative answer seems unlikely, do we have a societal obligation to develop intervention strategies designed to identify and encourage exceptionally talented youth?

The PCAST Panel on Education and Human Resources takes the view that modest federal investments should be made to assure young people with special aptitudes in scientific fields of an opportunity to develop their talents through enhanced education and related experience. The NSF Young Scholars Program for Mathematically Talented Students is a currently funded federal program in this field; other government programs have operated successfully in the past, and more should be adopted in the future. Several federal agencies could contribute to this effort by offering stimulating experiences to talented youth. Maybe all federal agencies should be challenged, individually and collectively, to contribute to a new initiative for youth development in these fields.

A little arithmetic puts the problem into perspective. If 3.5 million children are born in America each year, the top 1% by any measure is 35,000 children in each age cohort. If only these children were served, and their educational enrichment consisted only of a six week summer experience each year after the seventh through twelfth grades, that would require programs on a continuing basis for about 200,000 young people every year. These programs can be conducted for \$2,000 per student per year, requiring a total national commitment of no more than \$400 million per year (if every eligible student participated). Perhaps the federal government should risk half this sum by challenging local communities across the nation to match federal funds for the enhanced education of our most talented future scientists, mathematicians, engineers and technologists.

One might wonder whether the politics of equality would permit communities to meet this challenge. The growing success of the "Governors' Schools" and other specialized public secondary schools of mathematics, sciences and technology demonstrates that excellence can be good politics. Is it time for a special commitment to technical excellence from the Education President?

Conclusion

PCAST has been supportive of the President's initiatives in the field of education; we have not attempted to shape his program in any way. Perhaps the time has come for us to recommend a small step beyond his current educational agenda, seeking new commitments to those young people to whom we must look for future leadership in the fields of special concern to the President's Council of Advisors on Science and Technology.

PL:ekg

A handwritten signature in dark ink, appearing to read "Peter H. Rabinowitz". The signature is fluid and cursive, with the first name "Peter" being more prominent.

cc: Charles Drake
Tom Ratchford

"Document Control"

TYPE: INFORMATION

DOCUMENT NUMBER: 9124629

ORIGINATOR: 02

STATUS C

DIRECTORATE STATUS

FROM: POWELL, Colin L.: CHAIRMAN, JOINT CHIEFS OF STAFF

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 10/31/91

SUBJECT: RE: HIS ATTENDANCE AT THE NEXT PCAST MEETING.

DIRECTORATE STAFF
ASSIGNED: ASSIGNED:

ACTION STAFF
REQUIRED: ACTION:

SENDER'S DUE DATE:

OSTP DUE DATE: STAFF DUE DATE
DATE COMPLETED: DATE COMPLETED/DEPT:

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FILE: P-PCAST

CENTRAL FILES:



CHAIRMAN OF THE JOINT CHIEFS OF STAFF
WASHINGTON, D. C. 20318-0001

31 October 1991

CL 1001 4 AIO: 50

The Honorable D. Allan Bromley
The Assistant to the President
for Science and Technology
The White House
Washington, D.C. 20500

CL 1001 4 AIO: 50
DIRECTOR

Dear Allan,

Thank you, again, for the invitation to visit with the President's Council of Advisors on Science and Technology. At the moment, my calendar is a little uncertain on the 14th, but I think I'll be able to attend and I accept in principle. As the event nears and if it looks like I won't be able to do it, I would like to offer Admiral David Jeremiah to stand in for me. He is the Vice Chairman of the Joint Chiefs of Staff and is directly concerned with such matters.

With best wishes,

Sincerely,

COLIN L. POWELL
Chairman
Joint Chiefs of Staff

Bush Library Photocopy
Miscellaneous Handwriting

Powell

THE WHITE HOUSE

Nov. 4. 91

Dear Colin:

Many thanks for your note regarding the forthcoming Peace Meeting. I can fully understand your difficulty in predicting your schedule for Nov. 14. If you can make it

we shall be delighted; if you cannot Admiral Jacobiah, who I have already had the pleasure of meeting, would be most welcome.

Many thanks.

Sincerely
Allan

"Document Control"

TYPE: ACTION DOCUMENT NUMBER: 9124611
ORIGINATOR: 02 STATUS I DIRECTORATE STATUS

FROM: LOVEJOY, Thomas E.: SMITHSONIAN INSTITUTE

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 10/25/91

SUBJECT: A COPY OF A LETTER FROM ORRIN HATCH REGARDING THE
RECENT TRIP TO MEXICO AND BRAZIL. LOVEJOY RAISES THE
POSSIBILITY OF AN AMAZON VISIT.

DIRECTORATE STAFF
ASSIGNED: D. Allan Bromley ASSIGNED:

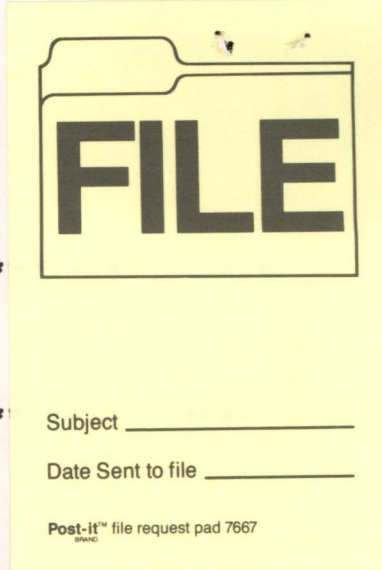
ACTION STAFF
REQUIRED: AS NECESSARY ACTION:

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OSTP DUE DATE: 11/14/91 STAFF DUE DATE
DATE COMPLETED: DATE COMPLETED/DEPT:

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ENVIRONMENT

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CENTRAL FILES:



*Charlie 1. to DAB,
According to
this does not
require a
response
DH
11/4*



91 NOV 1 A 9: 54
SMITHSONIAN INSTITUTION

Washington, D.C. 20560

U.S.A.

OFFICE OF THE
Assistant Secretary of External Affairs
DIRECTOR

25 October 1991

Dear Allan -

The enclosed from Corrin Hatch,
which you will find of interest,
leads me to raise the possibility of
our doing an Amazon visit sometime
perhaps with Bob Grady or some others?

Cheers -

Jo



UNITED STATES SENATE
WASHINGTON, D. C.

ORRIN G. HATCH
UTAH

file
SEP 16 1991

September 10, 1991

Dear Tom:

I can't begin to tell you how much I enjoyed being with you on this recent trip to Mexico and Brazil. You were a real addition to this trip, and both David and I appreciate everything you did for us.

You have a friend here. If I can be of assistance to you, please feel free to ask. Both Elaine and I look forward to having you over to our home for dinner. Take good care of yourself and keep up the good work.

Warmest personal regards,

Orrin G. Hatch
United States Senator

The Honorable Thomas E. Lovejoy
Assistant Secretary for External Affairs
Smithsonian Institution
SI 230
Washington, D.C. 20560

*I will never forget
our trip to the rain
forest. I hold you
& David responsible.
C.*

"Document Control"

TYPE: INFORMATION DOCUMENT NUMBER: 9124565
ORIGINATOR: 02 STATUS C DIRECTORATE STATUS

FROM: WILSON, Edward O.: MUSEUM OF COMPARATIVE ZOOLOGY

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 10/23/91

SUBJECT: REGRETS HIS INABILITY TO JOIN THE COMMITTEE NOW
FORMING ON BIODIVERSITY. HE ALSO RECOMMENDS SEVERAL
OTHER CANDIDATES.

DIRECTORATE STAFF
ASSIGNED: ASSIGNED:

ACTION STAFF
REQUIRED: ACTION:

SENDER'S DUE DATE:
OSTP DUE DATE: STAFF DUE DATE
DATE COMPLETED: DATE COMPLETED/DEPT:

COPIES TO: D. Allan Bromley
PCAST
ENVIRONMENT

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REMARKS: PHONE: EXT:

OSTP RECEIVED: 10/29/91 DEPT RECEIVED:
FILE: P-PCAST
CENTRAL FILES:

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MUSEUM OF COMPARATIVE ZOOLOGY

The Agassiz Museum



HARVARD UNIVERSITY . CAMBRIDGE, MASSACHUSETTS 02138 91 TEL. 617 495-2456 91 OCT 23 1991

23 October 1991

OFFICE OF THE
DIRECTOR

Dr. D. Allan Bromley
Assistant to the President for Science and Technology
Executive Office of the President
The White House
Washington, D.C. 20500

Dear Allan:

I was very grateful for the opportunity to meet with you again, this time with Governor Sununu, and thereby to move biodiversity closer to center stage.

I've decided, however, not to join the committee now forming to examine biodiversity and economic development more deeply. The reasons are personal (in no way political), having to do with the crushing schedule to which I've already committed myself in research, writing, and teaching--in several subjects!

On the other hand, since I am now completing a comprehensive book on biodiversity studies, I'll be glad to consult with the committee, sharing sources and ideas, if it doesn't require further travel.

As to committee members I'd recommend, *Thomas Eisner* of Cornell is tops: fully involved already as inventor of the concept of chemical prospecting, mediator in the recent Merck deal with Costa Rica, etc. Another obvious person is *Peter Raven*, a world authority on biodiversity and superlative scientific statesman; I presume you know him well through the NAS. A third leading prospect is *Gordon Orians* of the University of Washington, now serving as president of the Organization of Tropical Studies, a member of the National Academy, a non-ideologue, and an all-round expert.

With warm regards,

Edward O. Wilson

EOW:kmh

THE WHITE HOUSE
WASHINGTON

December 3, 1991

Dear Ed:

This is a much belated expression of appreciation for your coming to Washington for the meeting with Governor Sununu concerning biodiversity. Your presence at that meeting was of extreme importance and I only regret that you now feel that your other responsibilities make it impossible for you to participate in forthcoming meetings on this topic.

Your presentation to PCAST was masterful and I would wish only to thank you for it and your participation in the Sununu meeting as well as a lifetime of remarkable service to science generally.

With all best wishes,

Sincerely yours,



D. Allan Bromley
The Assistant to the President
for
Science and Technology

Professor Edward O. Wilson
Museum of Comparative Zoology
Harvard University
Cambridge, Massachusetts 02138

"Document Control"

TYPE: ACTION DOCUMENT NUMBER: 9124377
ORIGINATOR: 02 STATUS I DIRECTORATE STATUS

FROM: MOLLOY, Meghan E.: DIRECTOR OF SCHEDULING, U.S. DEPARTMENT OF
COMMERCE

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 10/04/91

SUBJECT: REGRETS SECRETARY MOSBACHER CANNOT ATTEND THE PCAST
MEETING SCHEDULED FOR 10/11/91. HOWEVER DR. ROBERT
WHITE, UNDER SECRETARY FOR THE TECHNOLOGY
ADMINISTRATION WOULD BE ABLE TO ATTEND INSTEAD.

DIRECTORATE STAFF
ASSIGNED: PCAST ASSIGNED:

ACTION STAFF
REQUIRED: FOR DAB'S SIGNATURE ACTION:

SENDER'S DUE DATE: STAFF DUE DATE
OSTP DUE DATE: DATE COMPLETED/DEPT:
DATE COMPLETED:

COPIES TO: D. Allan Bromley

WHITE HOUSE TRACKING #: CONTACT PERSON:
REMARKS: PHONE: EXT:

OSTP RECEIVED: 10/11/91 DEPT RECEIVED:
FILE: P-PCAST



4377
UNITED STATES DEPARTMENT OF COMMERCE
Office of the Secretary
Washington, D.C. 20230

RECEIVED

91 OCT 11 AIO :
October 4, 1991

OFFICE OF THE
DIRECTOR

Mr. D. Allan Bromley
The Assistant to the President for Science and Technology
The White House
Washington, D.C. 20000

Dear Mr. Bromley:

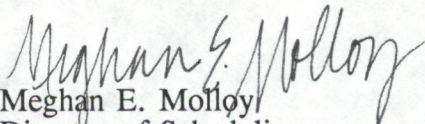
Thank you for your letter inviting Secretary Mosbacher to attend the President's Council of Advisors on Science and Technology meeting on October 11, 1991.

Unfortunately, the Secretary will be unable to attend due to a travel conflict. However, we appreciate your interest and hope that you will think of us when planning future functions.

If you would like to have Dr. Robert White, Under Secretary for the Technology Administration, represent the Secretary, please contact Nancy Dinse at (202) 377-1575.

Once again, thank you for your interest.

Sincerely,


Meghan E. Molloy
Director of Scheduling

MEM/bj

"CORRESPONDENCE TRACKING"

TYPE: INFORMATION DOCUMENT NUMBER: 9124202
ORIGINATOR: 02 STATUS C DIRECTORATE STATUS

FROM: POWELL, Colin L.: CHAIRMAN OF THE JOINT CHIEFS OF STAFF

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 09/23/91

SUBJECT: HE IS UNABLE TO ACCEPT THE INVITATION TO ADDRESS THE
PCAST MEETING ON SEPTEMBER 27.

DIRECTORATE STAFF
ASSIGNED: ASSIGNED:

ACTION STAFF
REQUIRED: ACTION:

SENDER'S DUE DATE:
OSTP DUE DATE: STAFF DUE DATE
DATE COMPLETED: DATE COMPLETED/DEPT:

COPIES TO: D. Allan Bromley
PCAST

WHITE HOUSE TRACKING #: CONTACT PERSON:
REMARKS: PHONE: EXT:

OSTP RECEIVED: 09/26/91 FILE: P-PCAST
DEPT RECEIVED:



CHAIRMAN OF THE JOINT CHIEFS OF STAFF
WASHINGTON, D. C. 20318-0001

23 September 1991

DIRECTOR

21 SEP 26 P 2:23

1000000000

The Honorable D. Allan Bromley
The Assistant to the President
for Science and Technology
The White House
Washington, D.C. 20500

Dear Allan,

I deeply appreciate the invitation to address your prestigious Council at the PCAST meeting on September 27. I am sorely tempted to cancel my previous commitments on Friday and join you for such an important discussion. However, I cannot do that and, unfortunately, I must decline your gracious invitation.

Although I will be unable to participate, I send best wishes for a most successful meeting. I genuinely wish my schedule were more accommodating.

Sincerely,

COLIN L. POWELL
Chairman
Joint Chiefs of Staff

Bush Library Photocopy
Miscellaneous Handwriting

"CORRESPONDENCE TRACKING"

TYPE: ACTION DOCUMENT NUMBER: 9124083
ORIGINATOR: 02 STATUS I DIRECTORATE STATUS

FROM: GOMORA, Bill: SIGMA XI

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 09/15/91

SUBJECT: REQUEST FOR ASSISTANCE IN OBTAINING A SPEAKER FOR
THEIR CHAPTER FROM PCAST.

DIRECTORATE STAFF
ASSIGNED: PCAST ASSIGNED:

ACTION STAFF
REQUIRED: FOR DAB'S SIGNATURE ACTION:

SENDER'S DUE DATE:
OSTP DUE DATE: 10/02/91 STAFF DUE DATE
DATE COMPLETED: DATE COMPLETED/DEPT:

COPIES TO: D. Allan Bromley

WHITE HOUSE TRACKING #: CONTACT PERSON:
REMARKS: PHONE: EXT:

CLOSED

OSTP RECEIVED: 09/18/91
DEPT RECEIVED:

FILE: P-PCAST



SIGMA XI, THE SCIENTIFIC RESEARCH SOCIETY

15 September 91

(708) 972-3329

OFFICE OF THE
DIRECTOR

91 SEP 18 P 3:40

RECEIVED

Dr. D. Allan Bromley, Chairman
President's Council of Advisors on Science and Technology
New Executive Office Building
Washington, D.C. 20506

Dear Dr. Bromley,

We would certainly appreciate your assistance in obtaining a speaker for our Chapter from your Council.

This seminar would be for one of our continuing series of inter-disciplinary science seminars. The length of this seminar would be approximately one hour. The scheduling is open sometime between now and next spring.

Thank you.

Sincerely yours,

Bill Gomora

Bill Gomora
Vice President
Building 301 Room C203B



UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
WASHINGTON, D. C.

TO THE SECRETARY OF THE INTERIOR
FROM THE DIRECTOR OF THE BUREAU OF LAND MANAGEMENT
SUBJECT: [Illegible]

1. [Illegible]
2. [Illegible]
3. [Illegible]
4. [Illegible]
5. [Illegible]

[78] From: Annie H. Barnett at NCMC 12/6/91 9:00AM (194 bytes: 3 ln)
To: Mary B. Suit at OSTP
Subject:

----- Message Contents -----

Action Item #9124083 completed via phone.

annie



RECEIVED

91 AUG 12 10:43

OFFICE OF THE
DIRECTOR

August 9, 1991

Dear Allen;

Many thanks for your very kind and generous letter which arrived last week.

In the meantime, I have hooked up with the Woodrow Wilson Center for a few months of reflection and decompression. I expect a serious effort to locate something permanent next month. All ideas welcome!

Good luck with your important work.

Sincerely;

Richard McCormack

P.S. I had breakfast this morning with Craig Fields, whom I had known when he previously served in DARPA. I strongly recommend that you include him in PCAST. Not everyone will agree with all of his ideas, but this man really does have something to offer, and I think that the President would find him an interesting contributor to any discussion. The general complex of issues relating to U.S. competitiveness is clearly going to be at the top of the coming campaign, and it is obviously important that the President be extremely well briefed on the issues involved. Fields would be very helpful in exposing the President to what he is going to hear during the Presidential debates in 1992.

THE WHITE HOUSE
WASHINGTON

December 3, 1991

Dear Dick:

I am delighted to know that you have hooked up with the Woodrow Wilson Center and I hope that you have been enjoying your time there. I very much regret the long delay in answering your letter in which you suggest the possibility of adding Craig Fields to PCAST, but I have been holding off to see whether any further vacancies would develop in the PCAST membership as at one time seemed possible. As you know, Bernadine Healy and Walter Massey necessarily resigned from PCAST when they took up their positions as Directors of NIH and NSF, respectively. They were replaced by Dr. Mary Good, the former Chairman of the National Science Board and Executive Vice President of Allied-Signal, and by Tom Murrin, the former Deputy Secretary of Commerce and now Dean of the Business School at Duquesne University. I had thought that there might be an additional vacancy but it turns out that the member in question has changed his plans and will remain.

Your suggestion is nonetheless an excellent one that I will keep in mind. Craig Fields is someone whom I got to know quite well during our period of overlap here and someone who has enormous capabilities in the technology area.

I must say that we miss you in our interactions with the Department of State but let me take this occasion to wish you a very happy, successful, and rewarding 1992.

Sincerely yours,



D. Allan Bromley
The Assistant to the President
for
Science and Technology

Mr. Richard McCormack
Woodrow Wilson International Center
for Scholars
1000 Jefferson Drive, Southwest
Washington, D.C. 20560

"CORRESPONDENCE TRACKING"

TYPE: Information DOCUMENT NUMBER: 9123899
ORIGINATOR: 02 STATUS I DIRECTORATE STATUS

FROM: Good, Mary L.: Allied-Signal

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 09/03/91

SUBJECT: Dr. Good will join September 12 PCAST dinner and for
half-day on September 13. Will arrive 9/12 at 7:00
p.m.

DIRECTORATE STAFF
ASSIGNED: ASSIGNED:

ACTION STAFF
REQUIRED: ACTION:

SENDER'S DUE DATE:
OSTP DUE DATE: STAFF DUE DATE
DATE COMPLETED: DATE COMPLETED/DEPT:

COPIES TO: D. Allan Bromley
PCAST

WHITE HOUSE TRACKING #: CONTACT PERSON:
REMARKS: PHONE: EXT:

OSTP RECEIVED: 09/05/91 FILE: P-PCAST
DEPT RECEIVED:

3899



RECEIVED

Allied-Signal Inc.
P.O. Box 1021R
Morristown, NJ 07962-1021
Telephone (201) 455-4729
Fax: (201) 455-2956

Mary L. Good
Sr. Vice President
Technology

91 SEP 5 P2:55

OFFICE OF THE
DIRECTOR

September 3, 1991

The Honorable D. Allan Bromley
Assistant to the President for Science and Technology
Executive Office of the President
Old Executive Office Building, Room 358
Washington, DC 20506

Dear Allan:

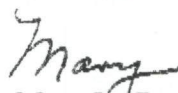
I was honored to get your note of August 1 indicating that the paperwork on my appointment to PCAST was nearing completion. I am very much looking forward to working with you and the distinguished members of PCAST.

To provide an orderly transition from my position as Chairman of the National Science Board, I have made a *confidential* announcement to the Board of my intention to resign from the NSB immediately after the October 11 Board Meeting in Washington. I have appointed a Nominating Committee so that a new Chairman can be elected at that meeting. As you can appreciate, the Board needs a full complement of officers even for the six or seven months involved in the remainder of my term. I have enjoyed my service on the NSB and I feel it is one of the Washington organizations that actually makes a significant contribution to the welfare of the country and its future.

Mr. Bossidy, our new CEO, has scheduled a very important meeting of the Allied-Signal Executive Committee for September 12 and 13. He and I have agreed that we will "*split the difference*" and I will join you and the PCAST group for dinner on September 12 and be with you for the half-day on September 13. Since I now have the PCAST schedule, I can, hopefully, avoid most of the time conflicts in the future. I will plan to take a cab from National Airport and go directly to Stone House at NIH. I should arrive before 7:00 p.m. and I would plan to take the bus back to the city with everyone else.

I do appreciate the confidence shown in me by the President thru this appointment. It will be a great experience to work with you and the PCAST members.

Sincerely,


Mary L. Good

MLG/jr

cc: A. Belzer w/attachment
L. Bossidy w/attachment



Dr. Mary L. Good
Sr. Vice President-Technology

Allied-Signal Inc.
P. O. Box 1021
Morristown, NJ 07962
Tele. (201) 455-4729

TELECOPIER INFORMATION SHEET

Name: The Honorable D. Allan Bromley

Address: Washington, DC

Telephone Number: (202) 456-7116

FAX Number: (202) 395-3261

From: Mary L. Good

Total pages (including information sheet): 2

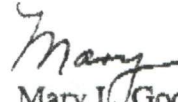
Date Transmitted: 9/3/91 Time Transmitted: 1:15 p.m.

If you do not receive all pages,
please call:

Jean Rynkiewicz, Secretary to M. L. Good
Tele: (201) 455-5315
Fax: (201) 455-2956

I do appreciate the confidence shown in me by the President thru this appointment. It will be a great experience to work with you and the PCAST members.

Sincerely,


Mary L. Good

MLG/jr

cc: A. Belzer w/attachment
L. Bossidy w/attachment

TOTAL P.01



Dr. Mary L. Good
Sr. Vice President-Technology

Allied-Signal Inc.
P. O. Box 1021
Morristown, NJ 07962
Tele. (201) 455-4729

TELECOPIER INFORMATION SHEET

Name: The Honorable D. Allan Bromley

Address: Washington, DC

Telephone Number: (202) 456-7116

FAX Number: (202) 395-3261

From: Mary L. Good

Total pages (including information sheet): 2

Date Transmitted: 9/3/91 Time Transmitted: 1:15 p.m.

If you do not receive all pages,
please call:

Jean Rynkiewicz, Secretary to M. L. Good
Tele: (201) 455-5315
Fax: (201) 455-2956

"CORRESPONDENCE TRACKING"

TYPE: INFORMATION DOCUMENT NUMBER: 9123858
ORIGINATOR: 02 STATUS C DIRECTORATE STATUS

FROM: KENNEDY, Ken: RICE UNIVERSITY

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 08/27/91

SUBJECT: HE IS DELIGHTED TO SERVE AS AN EXPERT ASSISTING THE
PCAST PANEL ON HIGH PERFORMANCE COMPUTING AND
COMMUNICATIONS.

DIRECTORATE STAFF
ASSIGNED: ASSIGNED:

ACTION STAFF
REQUIRED: ACTION:

SENDER'S DUE DATE:
OSTP DUE DATE: STAFF DUE DATE
DATE COMPLETED: DATE COMPLETED/DEPT:

COPIES TO: D. Allan Bromley
PHYSICAL SCIENCES
PCAST
ADMINISTRATION

WHITE HOUSE TRACKING #: CONTACT PERSON:
PHONE: EXT:
REMARKS:

OSTP RECEIVED: 09/03/91 FILE: P-PCAST
DEPT RECEIVED:



3858

RECEIVED

91 SEP 3 AM : 56

OFFICE OF THE
DIRECTOR

August 27, 1991

Dr. D. Allan Bromley
President's Council of Advisers
on Science and Technology
The White House
Washington, D.C. 20506

Dear Dr. Bromley:

I am grateful for the efforts you and Gene Wong have made in forming the PCAST Panel on High Performance Computing and Communications. I realize that dealing with the conflict of interest issue is difficult. Your letter of August 12 has resolved the issue to my satisfaction, and I am delighted to serve as an "expert" assisting the panel.

I had already sent a set of forms from OSTP to Gene Wong. I would appreciate it if he would simply not file those forms. Of course, I am still willing to go through the process of obtaining any necessary security clearance.

Yours,

Ken Kennedy
Noah Harding Professor

"CORRESPONDENCE TRACKING"

TYPE: INFORMATION DOCUMENT NUMBER: 9123663
ORIGINATOR: 02 STATUS C DIRECTORATE STATUS

FROM: BUCHSBAUM, S.J.: AT&T

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 08/26/91

SUBJECT: A SHORT REPORT ON THE STATUS AND PROGRESS OF THE
PCAST PANELS ON HIGH PERFORMANCE COMPUTING AND
COMMUNICATIONS AND SCIENCE, TECHNOLOGY AND NATIONAL
SECURITY.

DIRECTORATE STAFF
ASSIGNED: ASSIGNED:

ACTION STAFF
REQUIRED: ACTION:

SENDER'S DUE DATE: STAFF DUE DATE
OSTP DUE DATE: STAFF DUE DATE
DATE COMPLETED: DATE COMPLETED/DEPT:

COPIES TO: D. Allan Bromley
PCAST
PHYSICAL SCIENCES

WHITE HOUSE TRACKING #: CONTACT PERSON:
PHONE: EXT:
REMARKS:

OSTP RECEIVED: 08/29/91 FILE: P-PCAST
DEPT RECEIVED:

3663

RECEIVED



AT&T
Bell Laboratories

Crawfords Corner Road
Holmdel, NJ 07733
908 949-5564

S. J. Buchsbaum
Senior Vice President
Technology Systems

91 AUG 29 P 4: 42

OFFICE OF THE
DIRECTOR

August 26, 1991

Dr. D. Allan Bromley
Assistant to the President on
Science and Technology
Old Executive Office Building
17th Street and Pennsylvania Avenue, N.W.
Suite 358
Washington, DC 20506

Dear Allan:

As requested, this is a short report on the status and progress of the PCAST panels on High Performance Computing and Communications (HPCC) and Science, Technology and National Security (STNS).

We are in the process of completing the formation of the HPCC panel which, as you know, has been delayed by the need to resolve issues of real or apparent conflict of interest. I hope that with those issues behind us now, the panel will begin its work early this fall.

The STNS panel is being more successful. We met twice, on August 5 and 6 in Washington and August 19-20 in San Diego. Our next meeting is scheduled for September 26-27 in Washington when we expect to meet with Brent Scowcroft, Dick Cheney/Don Atwood, Colin Powell, Jim Watkins, Bobby Inman and yourself.

During our first meeting, we succeeded in formulating five issues that we deem to be of presidential importance. These are:

- National Security Technology Strategy for Superiority
- Reform/Defense Infrastructure
- Continuing Vital Importance of Intelligence
- Proliferation: A System Approach
- New Emphasis on Defensive Systems.

They fall under the rubric of our overall objective of a policy for continued U.S. technological superiority.

Needless to say, I would be glad to brief PCAST in more detail on the above at our September meeting.

Sincerely,

A handwritten signature in cursive script, appearing to read "Sol".

Copy to
Members of the STNS Panel

"CORRESPONDENCE TRACKING"

TYPE: INFORMATION DOCUMENT NUMBER: 9123658
ORIGINATOR: 02 STATUS C DIRECTORATE STATUS

FROM: BUCHSBAUM, S.J.: AT&T

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 08/26/91

SUBJECT: A SHORT REPORT ON THE STATUS AND PROGRESS OF THE
PCAST PANEL ON SCIENCE, TECHNOLOGY AND NATIONAL
SECURITY.

DIRECTORATE STAFF
ASSIGNED: ASSIGNED:

ACTION STAFF
REQUIRED: ACTION:

SENDER'S DUE DATE: STAFF DUE DATE
OSTP DUE DATE: STAFF DUE DATE
DATE COMPLETED: DATE COMPLETED/DEPT:

COPIES TO: D. Allan Bromley
PCAST
Charles Herzfeld
NATIONAL SECURITY

WHITE HOUSE TRACKING #: CONTACT PERSON:
PHONE: EXT:
REMARKS:

OSTP RECEIVED: 08/29/91 FILE: P-PCAST
DEPT RECEIVED:

3658

RECEIVED



AT&T
Bell Laboratories

S. J. Buchsbaum
Senior Vice President
Technology Systems

91 AUG 29 P 3: 21

Crawfords Corner Road
Holmdel, NJ 07733
908 949-5564

OFFICE OF THE
DIRECTOR

August 26, 1991

Dr. D. Allan Bromley
Assistant to the President on
Science and Technology
Old Executive Office Building
17th Street and Pennsylvania Avenue, N.W.
Suite 358
Washington, DC 20506

Dear Allan:

As requested, this is a short report on the status and progress of the PCAST panel on Science, Technology and National Security (STNS).

The STNS panel has been quite successful. We met twice, on August 5 and 6 in Washington and August 19-20 in San Diego. Our next meeting is scheduled for September 26-27 in Washington when we expect to meet with Brent Scowcroft, Dick Cheney/Don Atwood, Colin Powell, Jim Watkins, Bobby Inman and yourself.

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- Proliferation: A System Approach
- New Emphasis on Defensive Systems.

They fall under the rubric of our overall objective of a policy for continued U.S. technological superiority.

Needless to say, I would be glad to brief PCAST in more detail on the above at our September meeting.

Sincerely,

Copy to
Members of the STNS Panel

"CORRESPONDENCE TRACKING"

TYPE: INFORMATION DOCUMENT NUMBER: 9123609
ORIGINATOR: 02 STATUS C DIRECTORATE STATUS

FROM: MURRIN, Thomas J.: DUQUESNE UNIVERSITY

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 08/20/91

SUBJECT: NOTICE THAT HE WILL NOT BE IN ATTENDANCE SEPTEMBER
12 AND 13.

DIRECTORATE STAFF
ASSIGNED: ASSIGNED:

ACTION STAFF
REQUIRED: ACTION:

SENDER'S DUE DATE:
OSTP DUE DATE: STAFF DUE DATE
DATE COMPLETED: DATE COMPLETED/DEPT:

COPIES TO: D. Allan Bromley
PCAST

WHITE HOUSE TRACKING #: CONTACT PERSON:
REMARKS: PHONE: EXT:

OSTP RECEIVED: 08/27/91 FILE: P-PCAST
DEPT RECEIVED:



OFFICE OF THOMAS J. MURRIN
DEAN OF THE SCHOOL OF BUSINESS AND ADMINISTRATION

RECEIVED

31 AUG 27 11:44

OFFICE OF THE
DIRECTOR

DUQUESNE UNIVERSITY

PITTSBURGH • PENNSYLVANIA • 15282
(412) 434-5156
FAX (412) 642-9106

August 20, 1991

D. Allan Bromley
Assistant to the President
for Science and Technology
The White House
Washington, DC 20006

Dear Allan:

Many thanks for your thoughtful and welcome message of August 1 --- which I'm answering after two week-long trips!

I've made an important commitment for September 12 and 13 --
- and, unfortunately, I'll not be able to join your session at that time.

Nevertheless, I look forward to supporting your magnificent leadership --- once we get through the approval process and I get my calendar "in sync" ...

Keep the Faith!

Good Luck!

God Bless!

Most sincerely,

Thomas J. Murrin
Dean

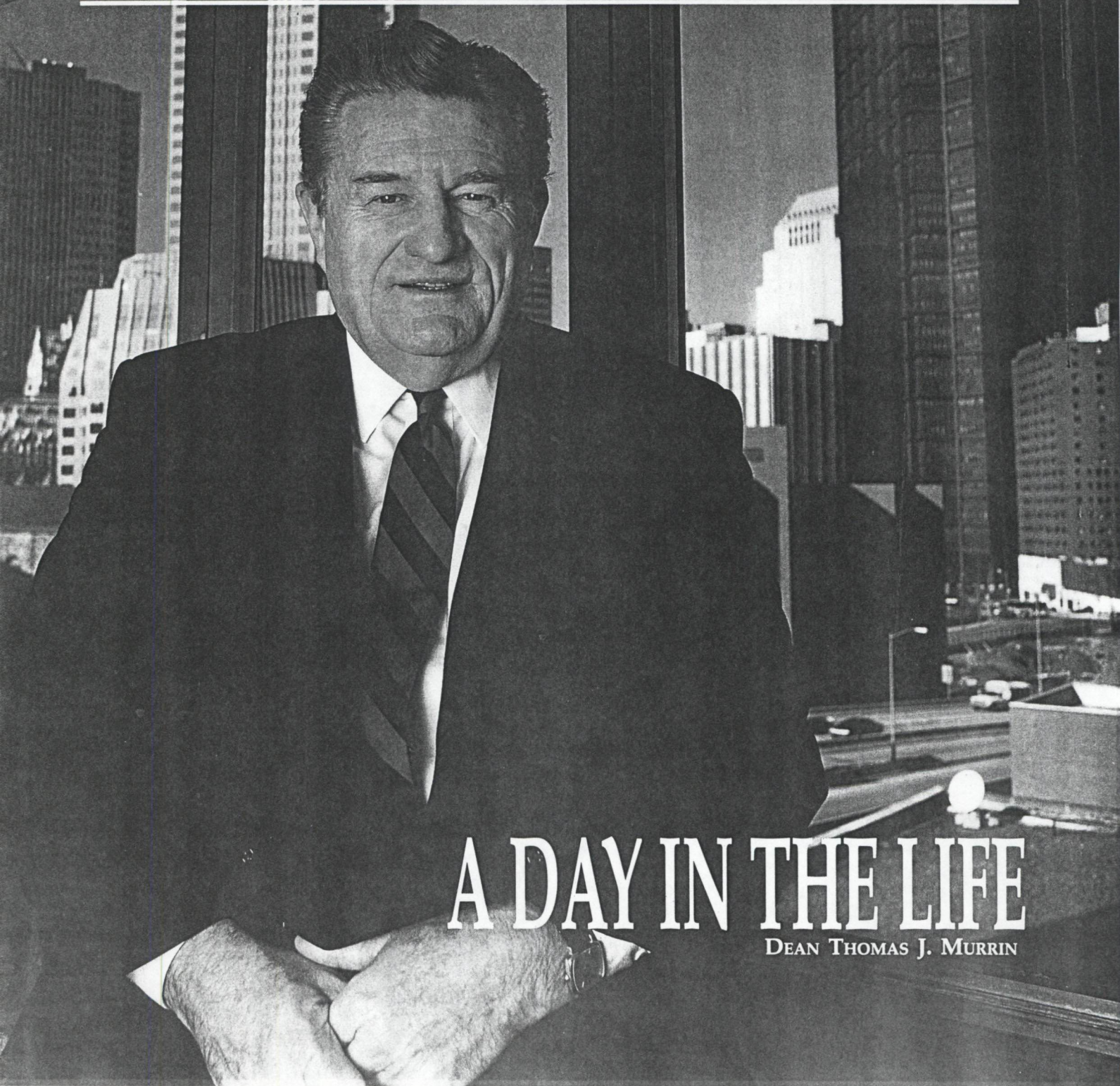
TJM:ss

VOLUME 3; NUMBER 3

SPRING 1991

university **Duquesne** *record*

A PUBLICATION FOR ALUMNI & FRIENDS



A DAY IN THE LIFE

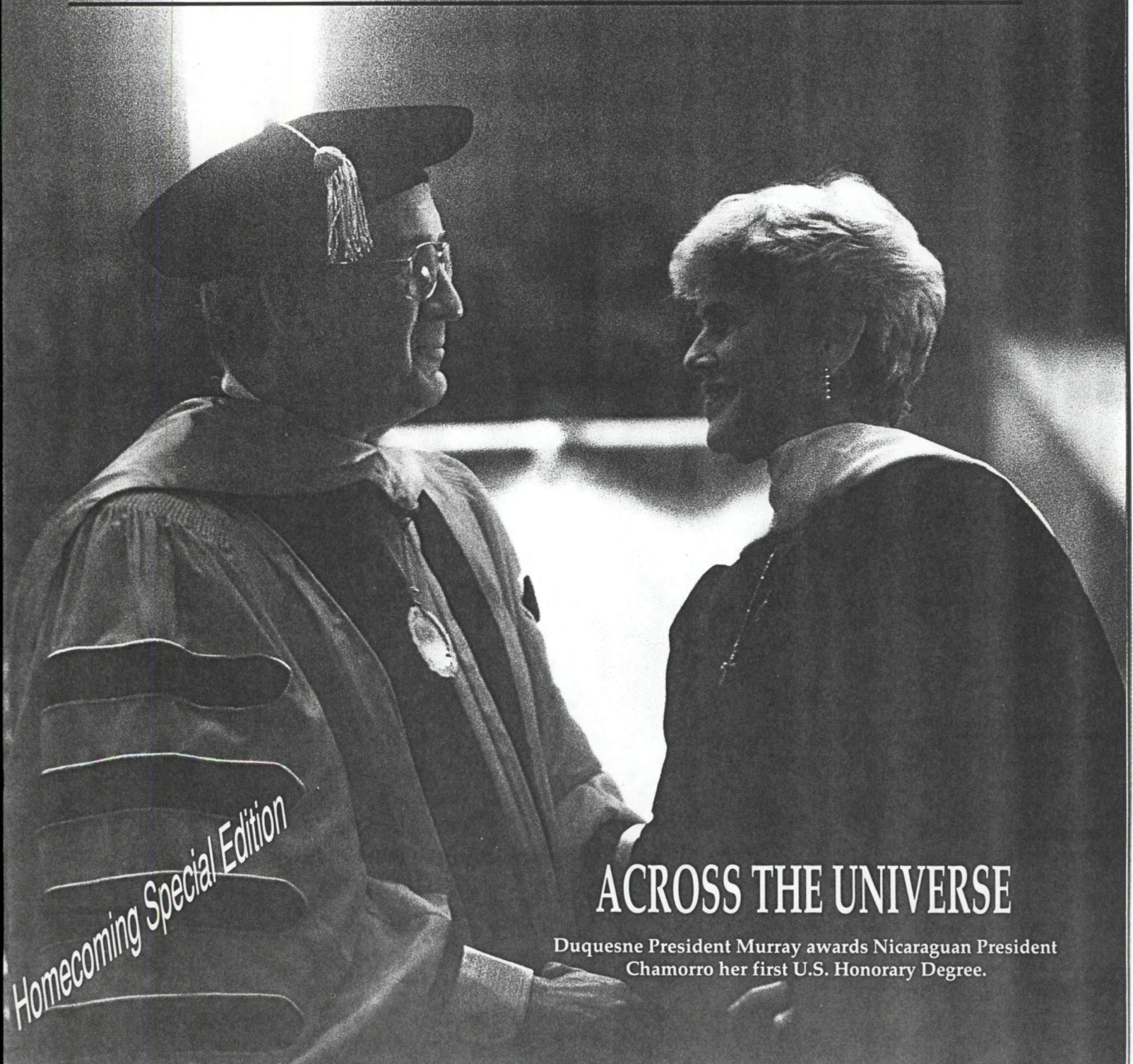
DEAN THOMAS J. MURRIN

VOLUME 3; NUMBER 4

SUMMER 1991

university **Duquesne** *record*

A P U B L I C A T I O N F O R A L U M N I & F R I E N D S



Homecoming Special Edition

ACROSS THE UNIVERSE

Duquesne President Murray awards Nicaraguan President Chamorro her first U.S. Honorary Degree.

"CORRESPONDENCE TRACKING"

TYPE: INFORMATION

DOCUMENT NUMBER: 9123444

ORIGINATOR: 02

STATUS C

DIRECTORATE STATUS

FROM: MCCORMICK, Richard: THE WOODROW WILSON CENTER

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 08/09/91

SUBJECT: RECOMMENDATION OF CRAIG FIELDS FOR PCAST.

DIRECTORATE STAFF
ASSIGNED: ASSIGNED:

ACTION
REQUIRED:

STAFF
ACTION:

SENDER'S DUE DATE:

OSTP DUE DATE:
DATE COMPLETED:

STAFF DUE DATE
DATE COMPLETED/DEPT:

COPIES TO: D. Allan Bromley
PCAST

WHITE HOUSE TRACKING #:

CONTACT PERSON:
PHONE:

EXT:

REMARKS:

OSTP RECEIVED: 08/12/91
DEPT RECEIVED:

FILE: P-PCAST

8/14
20-AD's
Communications?
DAB
8/19 - None from DHS
I don't know the man.
Informed Person



RECEIVED

91 AUG 12 AIO: 43

OFFICE OF THE
DIRECTOR

August 9, 1991

Dear Allen;

Many thanks for your very kind and generous letter which arrived last week.

In the meantime, I have hooked up with the Woodrow Wilson Center for a few months of reflection and decompression. I expect a serious effort to locate something permanent next month. All ideas welcome!

Good luck with your important work.

Sincerely;

Richard McCormack

P.S. I had breakfast this morning with Craig Fields, whom I had known when he previously served in DARPA. I strongly recommend that you include him in PCAST. Not everyone will agree with all of his ideas, but this man really does have something to offer, and I think that the President would find him an interesting contributor to any discussion. The general complex of issues relating to U.S. competitiveness is clearly going to be at the top of the coming campaign, and it is obviously important that the President be extremely well briefed on the issues involved. Fields would be very helpful in exposing the President to what he is going to hear during the Presidential debates in 1992.

June 3, 1991

To: All Fellows and Staff

From: Zed David 

Subject: Guest Scholar at Center
Division of International Studies

RICHARD McCORMACK
formerly, Under Secretary for
Economic and Agricultural Affairs
Department of State
(Autobiographical Note)

June 3-August 31, 1991

Born in Pennsylvania in 1941, I received my BA from Georgetown University, and a Ph.D. from the University of Fribourg in Switzerland.

I recently resigned from the State Department, having served as Under Secretary of State for Economics and Agriculture, U.S. Ambassador to the Organization of American States, and Assistant Secretary of State for Economics and Business during the course of the past decade. In my most recent incarnation, I was President Bush's chief "Sherpa" for the Paris and Houston G-7 Economic Summits.

Previously, I had served in various capacities at the White House, Department of the Treasury, Office of the Special Trade Negotiator, both Houses of Congress, and the Peace Corps, where I began my career. In the early 1970s, I ran for Congress in Republican primaries in Pennsylvania.

My wife, Karen, is a career employee at the Environmental Protection Agency, where she is a specialist on pesticides and other toxic substances. We have three young children, Charlotte 9, Justin 6, and Elizabeth 1.

My project involves a review of the Israeli economy, and the various obstacles that exist that prevent it from reaching its full potential.

"CORRESPONDENCE TRACKING"

TYPE: INFORMATION

DOCUMENT NUMBER: 9123452

ORIGINATOR: 02

STATUS C

DIRECTORATE STATUS

FROM: LIKINS, Peter: LEHIGH UNIVERSITY

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 08/07/91

SUBJECT: THE PCAST PANEL ON EDUCATION AND HUMAN RESOURCES.

DIRECTORATE

STAFF

ASSIGNED:

ASSIGNED:

ACTION
REQUIRED:

STAFF
ACTION:

SENDER'S DUE DATE:

OSTP DUE DATE:

STAFF DUE DATE

DATE COMPLETED:

DATE COMPLETED/DEPT:

COPIES TO: D. Allan Bromley
PCAST
INTERNATIONAL/POLICY

WHITE HOUSE TRACKING #:

CONTACT PERSON:

PHONE:

EXT:

REMARKS:

OSTP RECEIVED: 08/12/91
DEPT RECEIVED:

FILE: P-PCAST

Lehigh University



Peter Likins, President

Alumni Memorial Building 27
Bethlehem, Pennsylvania 18015
telephone (215) 758-3155

RECEIVED

91 AUG 12 P 4: 34

August 7, 1991

OFFICE OF THE
DIRECTOR

MEMORANDUM

TO: D. Allan Bromley
FROM: Peter Likins
SUBJECT: Panel on Education and Human Resources

The panel will meet from noon to 3PM on 13 September, immediately following the PCAST meeting. We will receive testimony from three experts in the field:

- Dr. Julian Stanley of the Johns Hopkins University
Study of Mathematically Precocious Youth
- Dr. Paul Sally of the University of Chicago Department
of Mathematics
- Dr. Stephanie Marshall of the Illinois Mathematics and
Science Academy.

All members of PCAST are encouraged to participate.

Our agenda calls for discussion of strategies for developing the full potential of American youth with the capacity to perform at advanced levels in science, mathematics and engineering.

We want to know what can be done to identify and stimulate latent talent, recognizing that capable American girls and some talented American minorities are most often lost as potential contributors to science and technology.

We seek also a better understanding of strategies to nurture the talents of promising youth. In particular, we have a special interest in the influence of teachers and other mentors on the development of budding young scientists, mathematicians, and engineers.

PL/lg

"CORRESPONDENCE TRACKING"

TYPE: INFORMATION DOCUMENT NUMBER: 9123218
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FROM: LOVEJOY, Thomas: SMITHSONIAN INSTITUTE

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 08/05/91

SUBJECT: RE: A DISCUSSION WITH ARTURO GOMEZ-POMPA CONERNING
THE VENUE FOR THE MEETING.

DIRECTORATE STAFF
ASSIGNED: ASSIGNED:

ACTION STAFF
REQUIRED: ACTION:

SENDER'S DUE DATE:
OSTP DUE DATE: STAFF DUE DATE
DATE COMPLETED: DATE COMPLETED/DEPT:

COPIES TO: D. Allan Bromley
INTERNATIONAL/POLICY
PCAST

WHITE HOUSE TRACKING #: CONTACT PERSON:
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SMITHSONIAN INSTITUTION

WASHINGTON, D.C. 20560

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OFFICE OF THE
DIRECTOR

31 July 1991

Arturo caught me at home
on a Sunday evening and I
agreed we could provide the
venue for the meeting. There may
be an important role for us
beyond ~~the~~ providing the venue

Jon

JUL 22 1991

UC MEXUS

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URGENT

NOT URGENT

DATE 7/22/91

FROM: ARTURO GOMEZ-POMPA

TO: DR. THOMAS LOVEJOY

DEPARTMENT: SMITHSONIAN INSTITUTION

TELEFAX NUMBER: (202)786-2304

PHONE NUMBER:

MESSAGE:

Number of Pages 4 Plus this header sheet 1 = Total Pages 5



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July 19, 1991

UNIVERSITYWIDE HEADQUARTERS
RIVERSIDE, CA 92521

United States-Mexico Binational Science Foundation:

A Summary of Its Status and a Proposal for Action

Efforts toward the creation of the United States-Mexico Binational Science Foundation, a concept developed under the leadership of U.S. Congressman George Brown in 1990, have come to a standstill. Enthusiasm for the project was first expressed in Washington, followed by an intergovernmental meeting, and then pursued by the Mexican government, but U.S. interest has been dampened by the Mideast War. Still, there remains unanimous agreement in both U.S. and Mexican academic, private, and governmental circles that a binational scientific effort is both necessary and timely.

A positive result of the initiative was Mexican President Salinas' preliminary approval of a matching fund, an idea promoted by Salinas' science counselor, Dr. Guillermo Soberón. Because U.S. funds, while appropriated, have not been released, Mexican resources have been reallocated to a series of programs intended to strengthen high level scientific research and to encourage Mexican scientists abroad to return to Mexican institutions of higher education and research, but the initial offer still may be valid.

It will be important to bring this issue to the attention of the two presidents before their meeting in the fall of 1991, and to remind them of the existence and importance of this initiative.

Following recent discussions with academics and governmental officials, both in Washington and Mexico, it has become apparent that a renewed effort may meet with success if the proposed Binational Science Foundation centers its activities on global environmental change. The issue embraces almost all branches of science and is, of course, one in which both countries have critical interests. Renewed effort in pursuit of the initiative is timely for several reasons:

- An increasing perception that environmental issues are and will remain the central concerns of the next decade.
- Threats to the two countries' shared environment (water, air, land, and biological resources) are increasing.
- Much of the debate surrounding the negotiation of the U.S.-Mexico-Canada free trade agreements have involved environmental issues.
- There is great need to set an example of positive agreement between Mexico and the United States.
- Connections and collaborative research interests between the Mexican and U.S. academic communities have never been stronger.

- Direct benefits to scientists of the United States and Mexico will significantly advance scientific research on global change.
- The United States has an opportunity to demonstrate its sincere interest in the Americas (an agreement with Mexico could be followed by several others).
- The benefits can be maximized by using debt relief mechanisms now available to raise funds.
- Congressman Brown's interest in establishment of the project is intense, as expressed at a recent meeting in Riverside.

The involvement and support of both the Mexican and U.S. Academies of Science are central to realization of the Binational Foundation. We propose a meeting in Washington, D.C. in September of 1991. The purpose of the meeting will be to remind the U.S. government of the opportunity to establish the Binational Science Foundation and to secure funding for binational research programs, to generate interest in the scientific issues, and to influence the release of the \$20 million allocated to this purpose. Sponsors of the meeting will include the National Academies of Science, the University of California Consortium on Mexico and the United States (UC MEXUS) and foundations. Dr. Peter Raven, Secretary of the National Academies of Science, has expressed his interest in participating in this project. Other participants should include Congressman Brown, directors of foundations such as Ford, MacArthur, Hughes, and Carnegie, leaders of the Mexican Academies of Sciences and Medicine,

distinguished scientists from both countries, and the science advisors of the presidents of the United States and Mexico.