

Business Briefs

Population Control

Honduran women subjected to forced sterilization?

According to charges made by Honduras's main labor federation, foreign companies operating *maquiladoras* (labor-intensive assembly plants) in northern Honduras are forcing female employees to accept birth control injections, in order to save on maternity benefits provided by Honduran law.

According to Luis Vaquedano, head of the Confederation of Honduran Workers, "Periodically, the companies give injections to women between the ages of 25 and 30. We don't know exactly what is in the shot, but it is a medicine to prevent pregnancy." The *Washington Times* of July 5 reported that the women are between 15 and 20 years of age. Some 3,000 women have thus far been involved, and may have been rendered sterile by the procedure. Vaquedano said the women have not protested out of fear of losing their jobs.

Honduran law provides that 40 days before and after delivery of a child be paid for by the employer, as well as on-the-job breaks for nursing mothers. The Honduran Labor Ministry is investigating the allegations, and the Catholic Church has denounced the alleged practice.

Research and Development

Private industry centers increase in South Korea

The number of R&D centers operated by private industries in South Korea has topped 1,000. Moreover, the industries' investments in their R&D efforts have increased greatly, surpassing 2% of their total sales figures, and the number of people engaged in R&D works in private industries has reached over 30,000.

Some industries' R&D facilities are bigger than and superior to the government's own. Joint research among industry, academia, and research institutes is also becoming popular. Even on the purely industrial level, interna-

tional cooperation in research has been increasing.

Private industries' R&D centers began to appear in the early 1980s. Since 1981, the government has given a tax break to industries engaged in research and manpower development. R&D workers have been exempted from military service. Since 1982, the government has reduced tariffs on the goods imported for R&D.

To classify the R&D investments by industry, in 1989, precision machinery was the leader, spending 5.46% of its total sales amount for R&D; followed by electrical/electronics industry, 4.92%; information service, 3.55%; the construction industry, 2.51%; transportation machinery, 2.36%; and general machinery, 2.12%.

The total amount invested in R&D by the nation's industries, at 1.98%, is still far less than Japan's 2.6% (1988), however.

Asia

China opens oil to Western investment

Although the People's Republic of China has historically insisted that it could develop its own mainland oil resources, for both economic and strategic reasons, this has now been dropped in favor of open appeals for foreign investment. As Wang Tao, head of China National Petroleum, put it, referring to the basins with potential oil reserves, "We have 167 daughters to marry off. He who comes first gets the prettiest one." Wang toured the U.S., Japan, and Canada in May, signing nine agreements and letters of intent with leading oil firms.

Most important is the Tarim Basin in Xinjiang. The Japan National Oil Co. has begun a four-year seismic survey of the Tarim. However, contracts are being offered for areas in 10 provinces. Other projects include: technology to increase the rate of recovery from existing fields, oil and gas pipeline design and construction, and technical and managerial skill services. A 3,100 kilometer pipeline from the North-

west to Central China will begin next year.

Meanwhile, the French firm Total-Compagnie Française des Pétroles signed a \$440 million deal with China to build a 5 million ton oil refinery in Dalian, Liaoning, the first joint venture of its sort, according to the *London Financial Times*. This refinery, however, is for cheap labor and "free trade" arrangements to process foreign oil for export. The facility will use only Middle East oil, and sell mainly to Japan, South Korea, Taiwan, and Hong Kong.

Space

Teller proposes fusion propulsion for Mars trip

Dr. Edward Teller of the Lawrence Livermore National Laboratory has proposed that rockets powered by magnetic fusion reactors be developed for missions to Mars and for deep space probes. He made the proposal in a paper presented to the First International A.D. Sakharov Conference on Physics, held in Moscow May 27-31.

"A conceptual design is discussed for a fusion rocket propulsion system based on the magnetic dipole configuration," said the paper. "The dipole is found to have features well suited to space applications. Example parameters are presented for a system producing a specific power of one kilowatt per kilogram, capable of interplanetary flights to Mars in 90 days and to Jupiter in a year, and of extra-solar-system flights to 1,000 astronomical units (the Tau mission) in 20 years. This is about 10 times better specific power performance than fission systems. Possibilities to further increase the specific power toward 10 kilowatts per kilogram are discussed, as is an approach to implementing the concept through proof-testing on the moon."

Teller's coauthors are A. J. Glass and T. K. Fowler of Livermore, J. F. Santarius of the University of Wisconsin Fusion Technology Institute, and A. Hasegawa, who is currently at Bell Labs and is one of Japan's leading laser fusion scientists.

Environmentalism

Compliance costs soar for steel industry

The cost of complying with environmental legislation increased over 50% for the steel industry between 1989 and 1990. The American Iron and Steel Institute released a study to this effect on July 5. Based on data from 24 companies which represent 71% of the industry, it shows:

- Capital costs for water-control facilities in 1990 were \$127 million, compared with \$85 million in 1989.

- Capital costs for air-control facilities in 1990 were \$98 million, compared with \$55 million in 1989.

- It costs the steel industry about \$1 billion a year to operate pollution-control facilities.

And yet, under the new rules of the Clean Air Act signed by President Bush last year, these costs will easily quadruple.

Energy

Fusion scientists meet at Princeton

Over 100 fusion scientists met at Princeton Plasma Physics Laboratory June 25-26 for the Annual Meeting of Fusion Power Associates. The symposium heard major reviews of the status and plans for both the U.S. fusion energy program and work on the design of the tokamak International Thermonuclear Experimental Reactor (ITER), which was proposed by President Gorbachov of the Soviet Union at the 1985 Geneva summit meeting.

Among the major developments discussed: The U.S. Department of Energy (DoE) has upgraded laser fusion research from a simple Division to that of an Office, the Office of Inertial Fusion Energy, and upgraded the civilian applications efforts in this direction. Naval Research Lab scientists proposed a breakeven experiment with the dense z-pinch. Laser fusion research has been redirected toward demonstrating low-gain pellets with an upgrade of the

Livermore Nova glass laser.

Prospects for the ITER moving beyond the simple design stage have led to an intense interest in the project by private industry. Soviet laser scientist N.G. Basov has proposed an international laser fusion facility. The Princeton TFTR and the European JET tokamaks will both begin energy breakeven demonstration experiments with tritium fueling within the next two years. Princeton and the DoE are now proposing a tokamak Burning Plasma Experiment as an intermediate stage to an ITER-type test reactor experiment and a follow-on to the TFTR.

Prof. G.L. Kulcinski of the University of Wisconsin reviewed the status of a neutron advanced fusion reactions and emphasized, "Fusion will be to space propulsion what fission is to the submarine." Dr. Kulcinski concluded that such applications could be demonstrated in the 2005 to 2015 time frame, including the demonstration of lunar mining of the advanced helium-3 fusion fuel.

Infrastructure

Maglev train tunnel through Alps proposed

A 100-kilometer magnetic levitation train tunnel through the Alps has been proposed in Austria, reported an editorial in the Vienna *Kurier* July 8. The daily wrote that "either plague or vision" will define the next century's transit through the Alps, calling for a "commitment to rail transport."

Author Jens Tschebull proposed an all-European project, guaranteed by European governments but carried out by private initiative. "A European Community-sponsored planning contest for such a Euro-Tunnel is long overdue. . . . After the completion of the relatively conventional Channel tunnel, a groundbreaking Central European tunnel could be created under the Alps. It could touch on a new field of international law: An international tunnel pipe for everybody's use, like the Suez Canal, extraterritorial and run directly by the European Community Transport Agency—I would invest on the spot."

- **U.S. RAIL** traffic collapsed in all categories during the week ending June 29 as compared to the same week last year, according to the Association of American Railroads. Car loadings, grain loadings, stone, gravel and sand loadings, motor vehicle, equipment, intermodal, and trailer/container loadings were all down significantly. Ton-miles carried on major railroads for the week ending June 29 declined 4.1%.

- **TWO INDONESIAN** islands will be linked by a new bridge that will be the first infrastructure project of that kind in the country. The five-kilometer bridge will be built between the eastern part of Java and Madura. Construction of the project is to begin this autumn, and will be completed by 1995.

- **INDIA** sent 25 tons of gold to the Bank of England to be held as security for borrowings from the Bank, the BBC has reported. Reserve Bank of India governor S. Venkitaraman said the shipment was made to ensure India did not default on repayment of short-term foreign debt.

- **THE SOVIET** harvest will be very poor this year, according to Premier Valentin Pavlov. Because of drought in the Urals and Kazakhstan, and heavy rains and flooding in southeastern Siberia and the Caucasus, this year's harvest will be only 190 million tons—50 million below last year's record. The Soviet Union will therefore have to import 77 million tons of grain, he said in Moscow July 3.

- **COFFEE** producing nations lost more than \$5 billion in the past two years because of "free trade," Colombian journalist Jorge Armando Riano charged in *La Prensa* July 2. Since the World Coffee Pact collapsed two years ago, around 50 producer countries lost the \$5 billion despite an increase of 14.2% in the volume of coffee exports.