

ISRAEL HIGH-TECH REPORT

A MONTHLY REPORT COVERING NEWS AND INVESTMENT OPPORTUNITIES

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From the Editor

The Harmonious and Shrill Sounds of the Horn

Since its first appearance, five years ago, The Israel High Tech Report has sounded the ("shofar") for Israel's high-technology industries, for innovations that have evolved through the country's institutes of higher learning, and for the private and public bodies that fund R&D. "Shofar" is the ancient Hebrew word for a ram's horn, much, for thousands of years up to the present day, has been sounded on ceremonial occasions such as the Jewish New Year.

Our enthusiasm for reporting about Israeli high-tech is, as usual, at a high pitch, and is constantly revitalized from on-the-spot observations, as well as from the comments of visiting scientists, businessmen and public officials, here to see what Israel has achieved.

In my recently published book *FROM THE LABORATORY TO THE MARKETPLACE*, I point out that Chinese and Indian visitors, for example, are convinced that Israel's agricultural achievements over the last 40 years can serve as models for their own countries' progress in feeding large populations. The world's air security experts come to Israel also to learn how El Al, the national airline, delivers protection against terrorists. There is widespread admiration for Israel's developing "alternate sources of energy", including geothermal, and for the use of solar energy in laser research. Intense interest also exists in Israeli diamond factories that operate with automated equipment, thereby maintaining a competitive edge for Israeli diamond polishers who must struggle against low-wage producers in other countries. Last but not least, Israel has become the eighth member of the exclusive club of nations who have successfully built and launched a satellite into orbit.

Despite all the positive accomplishments here, Israeli industrialists often complain about the lack of Government support to do even more. Although relations with Government ministries and so forth are polite and proper, sometimes Israelis join forces with potential foreign investors who are also critical of excessive bureaucratic intervention. Being so close to the center of the action here, we readily appreciate the stresses and strains underlying the relations between high-tech managers and Government ministries.

At present, there are at least three ministries who have loudly been promising more support for industry in general and R&D based manufacturers in particular. Instead of less, it would appear we are moving to a trend of more government involvement.

The Ministry of Science and Technology, for example, has had a relatively low profile until recently when it announced with a splash its new and comprehensive program for the future. The Ministry sponsored a New Year's eve supplement in the country's most influential daily newspaper which sounded the horn loud and clear. The Ministry wishes to receive a clear mandate for promoting scientific education and R&D. They have suggested a \$30 million

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budget to support their program, a very ambitious increase over its present budget, to say the least.

At the Ministry of Finance there is a willingness to extend guarantees for venture capital funds for small high-tech units within the country's economy. Our unequivocal opposition to Government guarantees has already been stated. They are counterproductive, at best, since the taxpayer is the one to foot the final bill.

At the Ministry of Trade and Commerce there are now ongoing discussions to create substantial pools of funds from budgetary sources for direct grants to be applied to encourage high-tech operations.

All of this Government interest is a mixed blessing, to say the least. In recent years excessive Government involvement in the affairs of the average Israeli has not led to happy results. As one American reader expressed it, a highly respected aerospace industry analyst, "I share the hope of a vibrant high technology community in Israel. My confidence in this vision would be higher if the Government limited its commercial interference to tax policy and direct regulation." We like the sound of his "shofar". It blends with ours.

INSTITUTES OF HIGHER LEARNING

Ben-Gurion University Resting New Anti-Meningitiae Vaccine

Ben-Gurion University researchers have begun experiments with a new vaccine against Haemophilus influenzae, a bacterium that is a principle cause of infantile meningitis. Tests with the vaccine in the U.S.A., Canada and Finland have proven successful over the past few years. The research team at Ben-Gurion University now hopes to prove that the vaccine is effective and to implement its use in routine immunization in Israel within two years. The BGU team has considerable knowledge and experience with

the natural history of infantile meningitis, which has a relatively high incidence in the Negev.

Some 200 children under age of 5 become ill with meningitis each year in Israel. This past summer alone, two infants died from the disease in Nahariya.

Haemophilus influenzae is a common bacteria present in the nasal cavity and throat but is usually inactive. Since the human body only begins producing antibodies against the bacteria at the age of two, infants are particularly vulnerable to the infection it can cause. Ninety percent of patients with meningitis are under two, and one fourth are below six months.

Experiments with the new vaccine, which supplies necessary resistance, are being conducted, with parental consent in four well-baby clinics in the Beersheva area, and will be extended to four other localities in a few months. Sponsors of the program include the Ministry of Health, the Pediatric Infectious Diseases Unit of Ben-Gurion University's Faculty of Health Sciences, and the Soroka Medical Center, headed by Dr. Ron Egan.

WEIZMANN SCIENTIST DEVELOPS NEW DRUG DELIVERY AGAINST AMOEBAS

Prof. David Mirelman of the Weizmann Institute's Dept. of Biophysics and the MacArthur Center for Molecular Biology of Tropical Diseases, has designed a new drug-delivery system against asymptomatic infections from intestinal amoeba (Entamoeba histolytica). The system has already proven effective in eliminating amoebas from the intestines of laboratory animals.

Over 500 million humans carry the parasitic protozoan in their intestinal tracts, and most do not exhibit,

symptoms for years. However, Prof. Mirelman's research has shown that seemingly placid parasitic amoebas can, under certain circumstances, become aggressive. They will attack the intestinal walls, causing dysentery, and may spread to the liver and brain.

Since the mucous membrane of the small intestine quickly absorbs most available antiamoebic drugs, they have only a slight effect on the quiescent *E. histolytica* which flourishes in the large intestine.

Eradicating the intestinal amoebas is only possible, therefore, if the drug is prevented from being absorbed into the surrounding cell tissue. Prof. Mirelman, in collaboration with Prof. M. Wilchek of the same department, achieved this by binding a potent antiamoebic drug to tiny silica particles. After parasites ingest the silica particles the drug is released and the parasites die. Since silica does not dissolve or become digested in the intestine, the drug-linked particles are not absorbed in the cell walls and are secreted naturally.

Silica was a convenient choice as a medium for the antiamoebic drug, because it is a common additive in foodstuffs and is also present in popular antidiarrheal preparations like Kaopectate, which have no negative side effects. The antiamoebic drug used in the experiments is a nitroimidazole derivative, which is also well known and approved for human gastrointestinal use. Conjugating the silica particles with the drug is a relatively simple and inexpensive process. Until now, however, the process has only been tested on small laboratory animals. Considerably more work will need to be done on the toxicology and pharmacology of the conjugates before they can be effectively and safely used in humans.

Negev Agriculture Advances are being Transferred to Kenya
On a recent visit to Ben Gurion University, the Kenyan Minister for Reclamation and Development of Arid and Semi-Arid Areas and Wastelands, George Mutua Ndotto, had reason to be impressed.

"Approximately 80% of Kenya is semi-arid and arid land" he said. "With the proper funds and the right technology, much of which we can acquire with Israel's help, we too can reclaim our wastelands."

Minister Ndotto met with Prof. Yiftach Ben-Asher, head of BGU's Jacob Blaustein Institute for Desert Research, who had just returned from a mission to the Kitui region of Kenya, the Minister's home region. Prof. Ben-Asher recommended a number of approaches to improving agriculture in Kitui, including better seed selection, fertilization and forage. A simple and efficient water harvesting method would also prove effective there.

Ben-Gurion University is active in a number of research projects in Kenya, as part of the new technological and scientific co-operation agreement between Kenya and Israel. One project is an AID, CDR project for improvement and yield maximization of various exotic African vegetables. Dr. Sam Mendlinger and Dr. Aliza Benzioni of BGU's Institute of Agriculture and Applied Biology are working in conjunction with researchers at the University of Nairobi. Other projects include a Dutch financed experiment with saline water irrigation, and a German financed study of the development of pastureland in arid zones.

Dr. Paul M. Kimani, head of Genetics and Plant Breeding at the University of Nairobi, the first Kenyan researcher to spend a sabbatical at BGU on a Koret

ISRAELI COMPANIES ON WALL STREET

Selected income and earnings summaries for the quarter ended June 30, 1989.
 Nearly all of these companies are intensively export orientated. Price are as of October 16, 1989
 and the price changes relate to those a month ago.

Company	Revs (In mil.)	Net Income (in thou.)	Price	NetChange
ELBIT COMPUTERS Defense electronics ELBTF OTC	38,548.	2,767.	8.375	-0.500
ECI TELECOM Telecommunications ECIL OTC	12,321.	1,038.	11.250	-0.825
ELSCINT Medical imaging ELT NYSE	25,3.	(0,639.)	1.625	+0.125
FIBRONICS Fiberoptics FBRX OTC	11,122.	709.	5.625	-0.625
INTERPHARM LAB. Biological products for health care IPLF OTC	3,640.	108.	3.250	n.c.
LASER INDUSTRIES Surgical lasers LAS ASE	7,356.	(1,498)	2.750	-0.500
OPTROTECH Electro-optical systems OPTKF OTC	17,314.	929.	7.625	+0.125
SCITEX LTD. Computer graphics SCIXF OTC	41,983.	5,911	11.250	-0.375
IIS INTELL. Computer peripherals IISLF OTC			4.375	-0.125
TEVA PHARMACEUT. pharmaceuticals TEVYF OTC	68,169	4,933	9.625	+0.250

Foundation fellowship), met with the visitors. Dr. Kimani's special interest in working at BGU was to learn new techniques for development of drought-tolerant crop cultivars. "I have been very successful in my short time at BGU, and I look forward to future co-operation," Dr. Kimani told the attentive Minister.

INTERMARK A STARTUP WITH SOLID BACKING

Intermark Technitran International Ltd. is an American technology-transfer and business development services company based in Minneapolis, Minnesota. In conjunction with Mr. Hadas Levin of Intermark-Israel, the company is raising capital to form a new company here which will channel seed capital and business development services to Israeli inventors. The company will also help businesses develop and commercialize inventions and products for the export markets in the US and other industrialized nations. Mr. Harlan T. Jacobs, Vice President and Treasurer of Technitran International Ltd. has commented that "Israel has demonstrated a clearly superior ability to innovate in various fields of high technology. These new technologies may well lead to economic stability, perhaps even a long-term sustainable prosperity as a modern industrialized nation."

Elta Electronics Maintains Profitable Operation

Elta Electronics Industries Ltd. an I.A.I. subsidiary reported more than \$7 million in profits for the first six months in 1989 and sales of nearly \$80 million. Elta is an outstanding producer of military radar and electronic warfare products and systems. Elta maintains a high export profile and its backlog has risen sharply to \$386 million as of mid year.

Oshap Technologies Profits Helped by One-Time Investment

Oshap's Technologies has reported a \$1.1 million profit for the first six months of 1989. The CAD/CAN specialists have yet to record profits from operations. The most recent profit and loss statement included a one-time injection of capital of \$4 million.

The Session After the Drop on Wall Street

The first stock exchange in the world to open for trading in the aftermath of the Friday October 13 trading session on Wall Street was the Tel Aviv Stock Exchange. The TASE is open for trading daily Sunday-Thursday. There was great nervousness among investors worldwide that weekend. After the sudden and unexpected drop of 192 points in the Dow Jones Industrial Average there was concern that a chain reaction could develop and investors looked to Tel Aviv to see how Israelis would react. Israeli small investors were a major factor in a market where popular averages fell across the board by seven per cent. To a degree it was a mirror performance of Wall Street's horrendous October 13 performance. Typically Elbit fell by 8.0%, Elron by 6.3% and Teva by a more moderate five per cent. Some \$450 million in share valuations had been swept away. The next day Monday Israelis had second thoughts. Mutual funds and insurance companies laden with cash pushed prices upward direction. More than one third of the big loss was recovered.

ISRAEL HIGH-TECH REPORT INDEX:

64.23 DOWN 3.87%

*ISRAEL HIGH-TECH REPORT INDEX is a weighted index made up of the shares of 10 leading high-tech companies.
Base: 100 as of 9/30/84

InterPharm Laboratories Sales Falter

InterPharm sales fell to under \$8 million in the first half of 1989 reflecting its relationship with its Swiss parent which controls marketing of the local buyer technologies companies marketing. The Ares-Serono Group a multi-national pharmaceutical and diagnostic company headquartered in Geneva, Switzerland has been marketing InterPharm's genetically engineered drugs. Unless Ares-Serono will increase its orders for InterPharm products, the Israeli based company will be unable to maintain the rapid increase in sales which have gone from \$2.5 million in 1984 to \$18.1 million in calendar 1988.

RECENT DEVELOPMENTS

A platform for demonstrations of flight verification systems recently soared aloft in a Lavie fighter. Israel Aircraft Industries is carrying out a series of flights for their flight verification program for avionics developed by leading Israeli aerospace companies including Elbit, El-Op, Alhut, IMI, Astronautics, Rada, TAT and Rafael. After the systems integration flight test will be completed they will be offered for sale for existing combat aircraft which are being modified or upgraded. These include the Mirage, the Kfir, the F-5, the Phantom and F-16. The systems which have been developed include displays, computers displaying to the pilot, air, electronic warfare and maintenance data, a digital fly-by-wire system, and navigation, ordnance display systems. Manof Systems, specialists in electronic banking software, has signed an agreement with Stratus Computers, a key operative in this field and supplier to IBM for its System/88, to jointly develop state-of-the-art banking communications and on-line transactions software. Yissum Holdings is cash rich and is

on the look-out for acquisitions. The company has recently been mentioned as negotiating with Tadiran to purchase its Contahal and Advanced Technology software subsidiaries. NCR's Israel unit has spent \$11 million on local market purchases over the past 40 months. NCR headquarters is considering contracting Israeli R & D in areas of printed circuit board testing, smart ID cards and software. Reuven Shai, NCR's purchasing manager, after discussions with NCR management in the US, will have a clearer picture of which projects NCR US is seeking for its world-wide operations.

IIS- Intelligent Information Systems (NASDAQ: IISLEI) has begun to offer its newly developed IS-353, a remote access model which serves to link twin-axis; peripherals to remote IBM systems

The Israeli subsidiary of National Semi-Conductor in Migdal Haemek is developing a new generation of chips with more than a million transistors. The CG-16 chip developed by NSM in conjunction with US and Israeli development teams will be used by Canon's LBP 8 laser printer, claimed to be among the most advanced unit of its kind.

The Technion's international management department has recently graduated one hundred managers from 36 developing countries, including countries which do not maintain diplomatic relations with Israel. Graduates were trained in the operation and management of ports and the management of health systems. The US Loral Electronics and Elta Electronics Industries, as reported in Aviation Week, have jointly developed an electronic warfare system which warns pilots of the presence of enemy missiles of the heat and radar seeking types. According to Aviation Week an earlier model developed by Elta is being used

by the Israeli Air Force on its F-16 fighters.

PRIVATIZATION OF TELECOMMUNICATION COMPANY POSTPONED

Government of Israel sources have announced that advanced plans for privatization of the Bezek Telecommunication company by means of public financing on Wall Street has been postponed. In spite of Bezek reporting profitable operations last year, the level of profitability is not high enough to satisfy American investment bankers who would be marketing Bezek to American and international investors. Israelis continue to be critical of Bezek's operations in response to the postponement of the financing issue.

One Israeli suggested that he can't understand why Bezek is not more profitable as it takes him at least three attempts to get through to one number. Ministry officials who have been working hard on the privatization have suggested that the lack of profitability can only be achieved by increasing the cost of the use of the telephone.

EL-OP Electro-optics Seeks to Improve Profitability.

EL-OP leading electro-optic manufacturer is trying to improve its operational results after recording a loss of \$5 million in the first half of 1989. While the losses were being recorded El-Op's exports took a sharp drop but with the back-log of \$235 million management has expressed a guided degree of optimism as to its ability to return El-Op to profitability in the current six months period. Expectations are that sales for all of 1989 will exceed \$105 million.

CONFERENCE

Scientists, Statesmen and Industrialists to Meet at Weizmann International Forum

A science and government international forum will be held at the Weizmann Institute of Science between December 10 and 13. The object of the international forum is to create a platform for dialog aimed at establishing a list of recommendations for the improvement of the relationship between science and government. The 50 invitees participating in the discussions will be, among others, Unesco Director-General Federico Mayor, former French Premier Raymond Barre, British Nobel Laureate Sir John Kendrew, former American Secretary of State Cyrus Vance, Director-General of the European Space Agency Reimar Lust, former Governor General of Australia Sir Zelman Cowen, former Chief Scientist of the U.K.

ISRAEL HIGH-TECH REPORT

NEWS AND INVESTMENT OPPORTUNITIES

Written for venture capitalists, investment bankers and bankers active in international trade, industrial researchers, business men, security analysts and portfolio managers, underwriters, private and institutional investors and individuals who need to maintain insights into Israel's evolving and dynamic high-technology field.

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Ministry of Defense and Energy Sir Hermann Bondi, former Science Adviser to U.S. Presidents Kennedy and Johnson Jerome Wiesner, and President of the African Academy of Sciences Thomas Odhlimbo.

Ministers Past and Present - Present-day cabinet members taking part will include Israel's Minister of Foreign Affairs Moshe Arens and Minister of Science and Technology Ezer Weizman. Coming from Australia will be that country's Science Minister, The Hon. Barry Jones, while the U.K. will be represented by the Parliamentary Under Secretary of State for Education and Science, The Rt.Hon. Robert Jackson.

Among former ministers coming is the Rt. Hon. Dr. David Owen, once Foreign Secretary and now a member of the House of Commons.

Media Participants - The media will be represented by Nature Editor John Maddox, Die Zeit Editor Theo Sommer, L'Express Editor Jean Claude Casanova, Foreign Affairs Editor Peter Grose, Ha'aretz Senior Editor Avram Schweitzer and New York Times senior columnist James Reston. Also in attendance will be representatives of the Times, the Financial Times, the BBC and the New Scientist.

All in all, participants are expected from Argentina, Australia, Brazil, Canada, Finland, France, the Federal Republic of Germany, Israel, Italy, Japan, Kenya, Mexico, the Netherlands, Portugal, South Korea, Spain, Swaziland, the U.K., and the U.S.

This Forum at the Weizmann Institute, co-chaired by Cyrus Vance and Sir Zelman Cowen, was initiated and is being sponsored by Lilian Hertzberg of New York. It is co-sponsored by the International Federation of Institutes for Advanced Study (IFIAS).

NEW PRODUCTS

New Photo-Plotter

Optrotech Ltd. is introducing a new system to its image product group: the IMAGE 5008. The new system comprises a new generation, high performance, automated engineering, tooling and photoplotting system, based on patented 32-beam laser technology. The company's research and development efforts in spite of tight budgets continue to result in world class products

Offering the highest throughput available in the market, the I5008 provides resolution of up to 8,000 lines per inch, and large format (37" x 34") printing. With its automatic loading/unloading option and direct feeder to film processing, the system enables fully unattended, automatic plotting, providing efficient operation with lower operating costs than currently available systems. System deliveries were scheduled to begin in September, 1989.

LASER AIMS AT COMPLETE MARKET

Laser Industries Ltd. is positioning itself on the American market place by expanding its product line. Laser Industries sells in America through its wholly-owned subsidiary. Management efforts have focussed in restructuring local companies marketing arm which services its most important market. Sharplan Lasers Inc. now is offering what it considers its most complete line of lasers and delivery systems available to surgeons and doctors.