ISRAEL HIGH-TECH REPORT

A MONTHLY REPORT COVERING NEWS AND INVESTMENT OPPORTUNITIES

JOSEPH MORGENSTERN, EDITOR

April 1990 Vol.VI. Issue No. 4

ISSN 0334-5307

From the Editor

The Quest forTechnology

The business side of innovation includes the fascinating area of technology transfer. The globalization of economic activities is internationalizing the transfer of technology. Governments are learning from the free enterprise business sector that technology purchases can speed up the flow of economic benefits to nations. The United States by placing restrictions on the free transfer of technology to Russia has positively influenced the Soviet position on human rights. Economic ties and friendshiphs are formed, forged and strengthened between those countries where the free transfer of innovative technology is commonplace. Israel is a country active in bi-directional technology transfer. With the exception of governmental supervision of defense system technology transfer there are no restrictions. Innovation and enhancement of human resources comes naturally to a people living in a small geographic area, where human resources are an important national asset..

Technology transfer stories are intriguing because they deal with an interesting group of people. The innovators are on one side. The potential buyers, the developers and the marketers of the technologies being acquired are the counterpart. Economic exploitation of innovation often takes takes much effort and time but when major economic benefits begin to accrue it again places a premium on human resources. This is a natural development in countries as Israel where quantitatively and qualitatively human resources exceed the supply of natural resources.

In this issue we follow the path of a search for technology transfer opportunity. Britain's foremost technology transfer group, generally reserving its activities within the United Kingdom, was having a close look at the possibility of acquiring the rights to an Israeli innovation.The sides were well matched and the negotiations were being carried out on an even field. The locals possessed the know-how but lacked the financial, manpower and international brawn to develop their technology and and to market products in large markets.. The visitors were seeking to acquire the rights to innovation which could result in profits from worldwide license fees. It is premature to speculate whether a "deal' will be signed but the British Technology Group is looking into it closely. It is not the first visit to the proverbial "well of Israeli innovation". In the past the prestitgious British company has acquired the rights to an Israeli innovation in the medical field.

The world market for caviar may be enlarged some day due to an innovative Israeli process which has resulted in a caviar substitute. The innovators working with the commercialization arm of the Technion

In this Issue

Subscription: I year $150.-. Bulk copy and reprint information available on request

Circulation Offices: Israel Publications Inc., 47 Byron Place, Scarsdale, N.Y. 10583, USA.
Attention: Mr. Robert M. Bruckenthal Tel.: 914- 723 8321 FAX 914-723 8340
Editorial Offices: Asia House, 4 Weizmann Street, Tel Aviv 64239, Israel
Tel: 972-3-430817. Tlx: 33611 EISGR IL. Fax: 972-3-255816

Institute of Technology are confident that their best strategy is to transfer the caviar technology overseas. The innovation is a kosher caviar which leading Israeli chefs have agreed is as tasty as the authentic Russian product. Wee have been invited by the food innovators to taste the product The story of the development of this product, said to be a potential major competitor to the Russian caviar, the price of which has risen to $107 for 100 grammes, will be the subject of our coverage in a future issue

****

British Technology Group Seeking Technology Transfer Agreement:

Technology transfer is one of the ways whereby innovators carrying out research and development in Israel can open up windows of opportunity to the commercialization of their inventions

Robert A. H Mitchell from the Inter-Corporate Licensing unit of the London based British Technology Group, the world's leading technology transfer organization, was in here in March meeting with Israeli innovators and developers of technologies. His meetings may lead to the acquisition of an Israeli innovation BTG generally concentrates its activities in the United Kingdom but Mitchell an inter-corporate licensing specialist has pinpointed a local innovation which could form the basis of an agreement for technology transfer. Besides meetings with members of industry Mitchell met with Yigal Erlich, the chief scientist of the Ministry of Industry and Trade and Yair Amitay, managing director of MATIMOP, the Industrial Center for Research and Development. Mitchell was testing the waters as to the position of the OCS on the subject of technology transfer which is sometimes a sensitive subject in Israel where "brains" are considered as an important national resource. The British Technology Group's turnover in 1989 was 25 million and earned five million, nearly all from royalties.

Mitchell would reveal little about ongoing discussions but other sources confirmed that the focus of interest was a controlled environment incubator developed by Rotem Industries Ltd.

Rotem commercializes the developments of the NCRN-Nuclear Research Center Negev. NCRN as part of its activities in the field of equipment and electronic systems has developed an innovative incubator for premature infants. The patents and know-how covering this incubator are the basis of the negotiations of the technology transfer opportunity between the British Technology Group and Rotem Industries. NCRN among other research equipment uses a natural uranium-fueled reactor, with a 25 megawatts maximum output Its research and development activities cover a number of scientific areas: lasers for medical and optical components; crystal growth technologies, laser rods and semiconductor materials: systems for use in wind tunnels, , clinical diagnostics: the applications of radioactive materials including labeled compounds and radio pharmaceuticals.

Should an agreement be signed it will represent a second technology transfer agreement between the British Technology Group and an Israeli entity. The first ever agreement between BTG and an Israeli innovator was signed with Atlas Researches Ltd.. developers of medical technology specializing in health care and intensive care monitors. The agreement covers an apneamometer, an intensive care monitor which detects and alerts breathing stoppage in babies who are under intensive care in premature hospital units. Atlas Researches has secured patents in Israel, in the United States and in Japan for its apneamometor. After the research and development stage, according to Daniel Atlas, clinical studies were carried out at Israeli in Beilinson Hospital. Additional development work was done in conjunction with Drs. Robert Judaikin and Seymour Hoffman of the Sleep Disorder Center of the Haifa Technion Institute of Technology, providing the necessary credibility for BTG to buy the technology.

RECENT DEVELOPMENTS

The Academy of Sciences Directs $10 million for R&D

The Israel Academy of Sciences and Humanities, a society of distinguished Israeli scholars and scientists to promote scientific endeavors, has announced that it is directing $10M for research institutes of higher learning.

The Academy's interest is to initiate and foster basic scientific research in conjunction with the Planning and Grants Committee of the Council of Higher Education. The Academy administers a number of funds including the Fund for Basic Research, which promotes basic research in all fields of the humanities and natural sciences.

Sophisticated Games

One of the members of the Eisenberg Group of Companies and Elbit Computers Ltd, will be jointly developing and marketing sophisticated electronic products for the consumer market.

The first product line will consist of sophisticated toys. The electronic toys have been part of a development project of TMD, the Eisenberg Company involved in research and development of technological products and systems. The joint venture company called Playtech, will be aiming at entering the consumer toy markets in Japan and the United States and will involve electronic games which can be enjoyed on home computers.

Kibbutz Industry Moves Against Counterfeiters

Kibbutz Gaash has developed a device which detects counterfeit bills including dollars, Deutsche marks and Japanese yen. The kibbutz personnel claim that it is the smallest of its type in the world. Laboratory tests have rated it as being 90% reliable. Most of the existing products, which aim at the $1 billion counterfeit American currency market, employ ultraviolet light to detect counterfeit printing errors whereas the kibbutz detector identifies magnetic particles in the counterfeit notes. In addition to an audible beep, a green light indicates that the bill is "clean". The unit sells in the US for $100.

Investors Show Strong Interest in Elta

The line of local and foreign investors seeking to buy a 49% interest in Elta Electronic Industries Ltd, is long. Local companies, including Elbit computers Ltd and the Israel Corporation, have been joined by un-named foreign companies who are interested in one of Israel's premier electronic industries. Elta employs 2,500 of whom approximately one-half are engaged in research and development. Elta's R & D includes a variety of systems for the defense needs of Israel and other countries. Among the products it has developed is a multi-mode airborn radar family for fighter aircraft of various sizes, which is derived from the Lavi radar; an airborne early-warning system; a new tactical ground radar; mini-RPV payloads including electronic sensors, and other sophisticated systems employed in the defense area.

Elta is a subsidiary of Israel Aircraft Ltd. IAI whose remaining shares are owned by the Government of Israel is putting its share-holding on the block as part of the currently on-going privatization program.

Alligator Know-how Leads to Joint Ventures

One of the Clal (Israel) Ltd's subsidiaries holds a 50% shareholding in an Alligator Farm in Honduras.

Clal, one of the largest investment companies in Israel has learned that alligator farms are profitable enterprises. In partnership with American businessman Herman Brooks, Clal

Israeli Companies on Wall Street

Selected income and earnings summaries for the 9 months ended September 30, 1989, unless otherwise indicated. Nearly all of these companies are intensively export oriented. Prices are as of February 22, 1990 and the price changes relate to those a month ago.

Company	Revs (in$ mil.)	Net Income (in $thou.)	Price	Net Change
ELBIT COMPUTERS Defense electronics ELBTF OTC	117,200.	8,750.	8.625	-0.625
ECI TELECOM Telecommunications ECILF OTC	38,745.	3,671.	11.75	+0.5.0
ELSCINT Medical imaging ELT NYSE	108,000.	0,987.	2.625	+0.25
FIBRONICS Fiberoptics FBRX OTC	34,160.	1,450.	6.625	+1.0.
INTERPHARM LAB. Biological products IPLLF OTC	7,812.	0,236.	2.75	n.c.
LASER INDUSTRIES Surgical lasers LAS ASE	na	na	3.625	-0.125
OPTROTECH Electro-optical systems OPTKF OTC	52,920.	3,330.	8.75	n.c.
SCITEX LTD. Computer graphics SCIXF OTC	170,550	21,687.	21.00	+2.125
IIS INTELL. Computer peripherals IISLF OTC	8,173.	2,007.	4.625	n.c.
TEVA PHARMACEUT. Pharmaceuticals TEVYF OTC	191,250	11,980.	10.75	+1.25
ELRON ELECTRON. ELRNF OTC			5.75	-1.25

has interest in an alligator farm in Orlando, Florida. It has similar interests in alligator farms in South Africa, Kenya. In Israel there is one on Kibbutz Gan Shmuel.

IIS Invests $8.5 million to Expand Marketing

IIS, Intelligence Information Systems, has purchased for $8.5 million the international operations of Lee Data, who have clients in in North America and Europe. Sales last year exceeded $30 million.

As a result of the acquisition, IIS, which produces computer peripheral equipment for use with medium and large IBM and IBM compatible mainframe computer systems, will have 36 sales offices and service centers in the United States in addition to a distribution chain in Europe. The acquisition is estimated by IIS management to increase its yearly sales considerably and expects exports this year to reach $25 million.

Rosh Systems Still not Profitable

Rosh Intelligence Systems Ltd, developers of artificial intelligence based systems for field service of computerized equipment, is expected to report a loss of $1.5 million for 1989. Rosh is an Elron Electronic Industries affiliate employing 40 people in Israel. Of these 25 are involved in research and development.

The losses have been attributed to high R&D costs and initial marketing entry expenses. The company's system is considered as having a major potential for large sales, due to its innovative technology which allows quick and reliable field service of computer equipment. Much favorable comment has come from US trade journals who have praised the Rosh system as providing cost efficiencies.

Oshap Technologies Cashes in on Technomatix Sale

Oshap Technologies Ltd. has announced that it has entered into an agreement to sell 27% of its holdings in its Belgium based subsidiary Technomatix for $3.6 million. The un-named buyers are members of the European Venture Capitalists.

Oshap Technologies produces an advanced computer work-station - Robcad - designed to assist engineers in implementing flexible automation applications. The system enables optimal placement and functioning of robots and their peripheral equipment by simulating, testing and verifying the merits of alternative solutions to a manufacturing problem.

Teva Reports Healthy Growth in Sales and Profits

Teva Pharmaceutical Industries Ltd has reported that profits in 1989 totalled NIS 31.6 million as compared with NIS 23.6 million in 1988.

In the past year sales totalled NIS 526 million. Teva 55 years old this year, Israel's largest pharmaceutical company, develops, produces and markets medicines, pharmaceuticals and veterinary products for the Israel and overseas markets.

Israel High-Tech Report Index*

83.54 + 2.63

*ISRAEL HIGH-TECH REPORT INDEX is a weighted index made up of the shares of leading high-tech companies.
BASE=100 AS OF SEP.30,1984

Claridge Israel Finalizes Investment in Optrotech

Claridge Israel, the investment arm of the Canadian Bronfman family group, has signed a final agreement with Optrotech and Elron Electronic Industries Ltd, Optrotech's major shareholder, relating to a $16 million investment by Claridge in Optrotech. Optrotech Ltd has reported that net income for 1989 totalled $4.5 million compared with $3.1 million for 1988. Sales soared to an alltime high of $73 million compared to $62 million in 1988. Optrotech employ 363, of whom 80 are engaged in R&D and is an acknowledged world leader in the development of sophisticated electro optical systems for the printed circuit board industry.

Optrotech's equipment provides full automation to the manufacture and inspection of printed circuit boards.

Quick Spun-off

Elron Electronic Industries in February of this year, signed a Memorandum of Understanding with a Japanese investor covering a $2 million investment in Chip Express Corp.

Quick, one of Elron's in-house projects, is a laser-base system for fast turnaround of gate-array prototypes, has been spun-off by Elron into the new American based company Chip Express.

Chip Express will open service centers for gate-array prototypes and it is expected that the first such center will be in the Silicon Valley in California.

89% of Motorola's Exports Based on own Development

Motorola Israel Ltd, a subsidiary of Motorola Inc. USA, has announced that its sales totalled $224 million in 1989 compared with $206 million in 1988. Of the total, Motorola exported $83 million. Motorola is considered a highly innovative company and its R&D activities include V.L.S.I. design; communications equipment; digital communications and digital command and control systems. The company employs more than 2,000 and the President, Elisha Shahmoon, has stated that of the total 1989 exports 89% or $74 million was represented by products which were developed in Motorola's laboratories in Israel.

IBM Picks IBS software

IBM Israel Ltd has chosen two software systems developed by Israel's International Business Software, for marketing in Israel. The systems chosen include a computer aided manufacturing system, supportive of factory management at all levels and a second system which serves as a comprehensive data collection package with analysis capabilities. The latter system operates on IBM AS-400 computers and makes available Hebrew language menus allowing a novice to operate it.

Fibronics Strong Fourth Quarter Lifts Annual Earnings

A very strong fourth quarter in which the company earned $1.0 million on sales of $14.8 million resulted in the fiberoptic communications company registering all-time high yearly sales and profits. In 1989. sales were $48.9 million and net profitsof $2.46 million or $0.39 per share.

Latest News from Research Centers at Israel's Institutes of Higher Learning

Is Israel an active participant in the Space Age? Yes, say students at the Technion - Israel Institute of Technology. They have already begun planning a solar-sail to be powered by solar radiation. Ultimately the sail will be moved along in space by solar wind, the

radiation originating from the sun. When completed, the Israeli designed-space sail, will take part in an international flight competition to be held in space in 1992.

The students at the Technion have undertaken a challenge which will test their engineering skills as the sail must be less than 500 kg and have an area of 10,000 sq.meters. When it is constructed, it will be put into a special container which will be launched into space in a high earth orbit .

Once in orbit it will be activated from earth, and expectations are that in less than six months the sail will reach the moon.

Ben Gurion University's Applied Research Institute is reporting satisfactory progress with ongoing research projects in Kenya. The areas cover the improvement and yield increase of various African vegetables; saline water irrigation; and the development of pasture land in arid zones.

Additional areas of expertise being introduced to Kenya include methods of water-harvesting and the utilization of existing water resources and agriculture development.

Farmers in Israel's arid valley north of Eilat are experimenting in cultivating microalgae in vertical polyethylene sleeves. This innovative method overcomes the key problem of cultivating in ponds; contamination of protozoa, the uneven distribution of light and temperatures at various depths of the pond.

The cultivation of microalgae in polyethylene sleeves is a closed system which prevents evaporation, allows for more light to enter and exposes microalgae to higher temperatures than in ponds. The technique has raised yields and the BGU scientists who have developed this technique are optimistic that this new form of microalgae cultivation will become an accepted procedure.

The interest in this organism is related to the continuous commercial demand for this product by the cosmetics industry. Other end-users are the food industry. One microalgi is already commercially used for fluorescent marking in medical diagnostics.

International Scientific Cooperation

Israeli scientists who are taking part in work at the Super Proton Synchroton accelerator at the European Laboratory for Particle Physics have installed a state-of-the art detector which has been especially built for experiments which are aimed at determining what the universe was like immediately after its birth.

Scientists worldwide believe that particles named quarks and gluons form the original gaseous state of matter, quark gluon plasma which existed at the time of the birth 20 billion years ago.

A Weizmann Institute team has developed a system which detects electron-positron pairs which theory dictates are connected to the "big bang."

An Efficient Water Filtration System

Hebrew University scientists have proven that with the use of selected and crushed basalt and tuff, two types of volcanic rock which are to be found in many countries, it is possible to filter water more efficiently and at lower prices than with the use of coal. A saving of as much as 80% is achievable. At the core of the system is the use of ground rock to which polyelectolytes are added. As a result impurities tend to bind better to the filtering rock.

Lighting up the Unseen and Creating A Lenseless Microscope: A Breakthrough Technology

"Single bases of DNA can now be brought into focus," says Israeli physicist, Prof. Aaron Lewis., who heads a team of scientists and researchers at the Hebrew University of Jerusalem. When speaking of DNA, the Jerusalem based physicist is referring to substances whose sizes are measured in milli-microns or one thousand millionths of an inch. The existing most-advanced light microscopes make visible objects which are approximately the size of the shortest wavelength of visible light. This wavelength measures about 400 nanometers. Previously many molecules but not single cells could be seen at one time.

In a recent issue of the Journal "Science" Raoul Kopelman, Chemistry Professor at the University of Michigan, and the Prof. Lewis-led team of researchers , published findings indicating that the group has produced a spot of light only 2 millionths of an inch wide and narrower than the lightwaves which formed it.

The innovation leading to the technology which will allow the imaging and seeing of genetic material whose helix is 2.0 nm diameter, has been already favorably mentioned in a number of leading international science journals as well as by Joe Bishop, prize winning science correcpondent oof the WEall Street Journal. Based on this discovery, the team is now working and developing a new microscope called a near field scanning optical microscope which will go beyond the physical limitations governing images which can be resolved only with the use of lenses. The researchers achieved a first by beaming a laser-produced light through holes made in glass pipettes, as small as 1/20th the size of the wavelength of light. As a result new information will become vsible when studying substances in micro-regions previously inaccessible with conventional light microscopes.

To overcome the limitations of the existing art Lewis developed an innovative technique. He created, with the use of microprocessor controlled pipette pullers, pipettes made of aluminum silicate with outside diameters of less than 50 nm. He coated these pipettes with metal and was able to obtain scans of rough surfaces with a resolution of less than 60 nm.

The benefits gained , when contrasting the technology it with the capabilities of the scanning electro microscope, is that microscopes, using the new technology, will be able to examine living cells at close range, in great detail and without damaging them Seeing living matter at the molecular level is only one of the applications of the innovative technology.

The light spots created could serve as a storage of more information per square inch in optical memories. parts for computers based on light waves instead of electrons.