

ISRAEL HIGH-TECH REPORT

A MONTHLY REPORT COVERING NEWS AND INVESTMENT OPPORTUNITIES

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A TOUCH OF VITAMIN C-THE CAPITAL DIET SUPPLEMENT:

A number of highly visible foreign investments that have reached Israeli companies over the past year are beginning to make their impact felt in a number of different and occasionally unexpected ways. Scitex in reporting its operating results for the first three months of 1989 notably was able to point that its all time high record profitability was impacted favorably by a reduction of financing expenses. The company's management unequivocally stated that the success was closely tied to the benefits stemming from their application of the funds that it obtained as a result of the Robert Maxwell investment. A closer examination of the company's financials clearly shows how important new capital can be in strengthening a company. The cost of financing business activities is a critically important area for any company especially for those who are not content to sell in Israel but compete on the international marketplace. In addition Israeli borrowers have lately had to contend with the American dollar's surging strength. The rise in dollar is accompanied by high dollar interest rates which only recently appear to be leveling. In Israel of 1989 companies irregardless of their credit standing even those rated "AAA" are bothered by the high cost of capital with its potentially devastating affect on corporate and profit ability. The ongoing dissolution of the Koor Industries conglomerate is an outstanding example.

Scitex is an exciting company and is rated as a leader in its field of activity of computer graphics. Robert Maxwell once he made his decision to invest in Israel found it easy to

pinpoint Scitex as a target investment. One of the publications in his international media group had experimented with Scitex systems was able to report on its effectiveness. An issue, which is far from new is being debated in Israel, "What can and should be done to assist science based industrially startups, who should provide the assistance and on what terms?". The Association of High Tech Industries in Israel is a young but increasingly more visible group which is trying to establish itself as a lobby which champions the interests of small companies in Israel. In a sense the name of the group is a misnomer as of its some members can not be classified as high-tech or been science based. Yet the Association is bringing to the attention of the public and the government the plight of smaller business units who possess bright ideas are having trouble in securing initial or operating capital. The Association in its efforts to draw attention to these problems recently went to the media and publicized that tens of young science based industries have packed up and moved plants and manpower outside of Israel's borders. Transfer of technology equipment and personnel is a two direction road. Kfar Blum a

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kibbutz in the Galilee couple of years ago did exactly the same when it purchased an operating plant in the Los Angeles area and moved it to the kibbutz. The kibbutz was engaged in the sprinkler and irrigation business. The purchase of the American plant just rationalized their business.

The number of Israeli companies that have been moved is probably far from being critical. Their departure neither indicates a trend nor does it portend a national danger, as the Association's president is suggesting. Yet there exists the need to rethink whether Israel as it readies for the challenges of the 21st century is doing enough to encourage innovation. The Association's answer is to call for the establishment of venture capital funds and government assistance. The association's platform has validity but its views tend to fall short of the mark as it does not address specifically such questions as taxations incentives and accessibility to capital markets. Human resources exist within Israel to develop innovation. The participants are businessmen are experiencing difficulty in expanding their business due to lack of capital and government backing. At the same time they are professionals who have elected on scientific and technological careers. They are the budding future industrialists who have entered high-tech. Barring the establishment of an overall plan to deal with these challenges the transfer of technology out of Israel and a drain brain may become serious problems.

NEWS FROM INSTITUTES OF HIGHER LEARNING.

ISRAELI-CHINESE COOPERATION CHEMICAL RESEARCH AT W.I.

Joint research, is being carried out by Prof. Qingliang Liu, an inorganic chemist from the University of Science and Technology, Hefei, China, and Prof. Abraham Shanzar, of the Organic Chemistry Department at the Weizmann Institute.

The Israeli scientist has been preparing synthetic molecules capable of binding iron, an essential element

in all living organisms, and transporting it into the cells. Prof. Liu, at the same time, was involved in coordination chemistry and more specifically, the study of the interaction between metals and binders.

After discussions in 1987, Prof. Liu applied for and obtained a visa to Israel; Prof. Shanzar applied for and obtained on behalf of his collaborator a fellowship. A year later they were in business at Prof. Shanzar's Weizmann Institute laboratory.

Their cooperative research could prove to be highly important in the field of biochemistry. Artificial channels could serve as a means of introducing iron or other metals into biological systems.

This line of study might also result in the creation of synthetic sensors.

ISOTOPE ANALYSIS UNRAVELS SECRETS OF ROMAN MARBLE:

Over 1,800 years later, it has been discovered that much of the white marble of the magnificent Roman amphitheater in the Jordan Valley, town of Beit Shean, then called Scythopolis, came from a quarry on the Turkish island of Marmara. Using isotopic analysis, Weizmann Institute graduate student Ze'ev Pearl and his supervisor, Prof. Mordechai Magaritz of the Institute's Isotope Research Department, have traced many of the marble artifacts found in Beit Shean and other...

Marble or metamorphosed calcium carbonate is not found in Israel. Therefore, any of it used to build numerous amphitheatres and palaces in Israel during the Roman and Byzantine period probably must have been imported, from nearby countries that formed part of the Roman Empire. By comparing the isotopic composition of marble ruins found in Israel with that of marble from quarries around the Mediterranean, Pearl has been able to determine the material's geographical origin.

In addition to analyzing isotopic composition, Pearl and Magaritz measure the trace elements present in a sample of marble.

An important advantage of these techniques is that they require only a small sample of material--less than half a gram.

THE WORLD CRANBERRY INDUSTRY HAS FRIENDS IN ISRAEL:

Cranberry juice has for years been folk medicine's favorite remedy for urinary tract infections. Now detailed scientific evidence is presented which lends credence to this popular claim. Research conducted by Weizmann Institute Professor Nathan Sharon, in collaboration with Tel Aviv University Prof. Itzhak Ofek, has demonstrated that cranberry juice prevents the bacteria, responsible for urinary infection, from adhering to the urinary tract, thereby facilitating their removal from the body.

Two compounds in cranberry juice, the scientists' found, inhibit the adherence of bacteria-producing fimbriae. One compound, fructose, a common ingredient in all fruit juices, inhibits the adherence of *E. coli* that carry MS fimbriae. Another compound, found only in cranberry juice, a polymeric constituent now under investigation, inhibits strains carrying M fimbriae. These findings may also explain why other juices are not effective against urinary tract infections.

Clinical studies are still needed to establish the medical relevance of this research.

A KIBBUTZ RELIEVES CHRONIC ACUTE PAINS:

Kibbutz Ginosar is situated on the shores of the Sea of Galilee. It was founded in 1937. Its first homes were up in the plain of Ginosar, as part of then a country-side settlement project known as Watch-tower and Stockade Settlements. The kibbutz is a community based on the precept of productive labour by all with collective responsibility and equality of all members. Today more than 700 people live there. The kibbutz economy is primarily based on mixed agriculture, red banana plantations, citrus groves, green fodder, grain, cotton, dairy cattle, poultry and fish. Ginosar due to its historic location serves as a center for Christian and Jewish tourism. In 1971 a turning point in the economic

history of the kibbutz took place. The members established Agar, an industrial plant manufacturing electronic equipment for pain relief and muscle rehabilitation. Agar, Ginosar Electronics and Metal Products based itself on research work done at the department of medical electronics anestheology and physical medicine rehabilitation, Jerusalem Hadassah-Medical Center. Pain is the body's warning system. It is distinct from other sensations in that it is carried by two pathways from the pain area to the brain. One of these pathways is characterized by carrying fast conduction carrying sharp sensations and the other slow conduction carrying duller sensations.

Along these pathways are numerous nerve centers shared by sensory nerve impulses other than pain. According to the existing theories of pain, if these shared nerve centers are overwhelmed with electrical impulses they can block the pain signals to the brain and thus control the pain sensation.

AGAR ELECTRONICS produces and markets several models of Transcutaneous Electrical Nerve Stimulators (TENS) based on patents. Modulation is an approach to eliminate pain through use of the body's natural resources. The TES therapy is beginning to be more widely adopted in the United States. The Agar products have been FDA approved and today are being marketed as part of the American medical healthcare system.

Agar products, whether in the area of pain release of muscle rehabilitation or muscle education inhibit both user adaption and addiction by means of a specially patented modulation pulse. Continuous, close relationship and work in the development and trial stages with Israel's medical centers including Sheba and Tel Hashomer and Hadassah and several major hospitals in the U.S.A. and Europe, provided necessary development as well as the feedback.

Based on experience in hospitals and clinics in and outside Israel a variety of different pains may be treated.

For localized pain a single channel

Israel High Tech Shares Traded in the United States

Selected earnings summaries for the quarter ended March 31, 1989.
Price quotations are from the 15th of the month and the change relates to the corresponding quotation a month ago.

<u>Company</u>	<u>Revs</u> (In mil.)	<u>Net Income</u> (In thou.)	<u>Share</u> <u>Price</u>	<u>Change</u>
BIO-TECH GENERAL* Biological products for health care BTGC OTC	8,746.	d6,805.	2.125	n a.
ELBIT COMPUTERS Defense electronics ELBTF OTC	38,548.	2,767.	7.000	-0,375.
ECI TELECOM Telecommunications ECIL OTC	12,321.	1,038.	9.000	+1,625.
ELRON ELECTRON. Invests in high-tech ELRNF OTC	36,647.	d0,692.	5.125	+0,125.
ELSCINT Medical imaging ELT NYSE	25,3.	d0,839.	1.375	+0,125.
FIBRONICS Fiberoptics FBRX OTC	11,122.	709.	4.750	+0,250.
INTERPHARM LAB.* Biological products for health care IPLF OTC	18,092.	505.	3.500	-0,500.
LASER INDUSTRIES Surgical lasers LAS ASE	n a.	n a.	3.000	+0,375.
OPTROTECH Electro-optical systems OPTXF OTC	17,314.	929.	6.375	+1,500.
SCITEX Computer graphics SCIXF OTC	41,963.	5,911.	11.375	+0,375.
IIS INTELL. Computer peripherals IISLF OTC	17,099.	3,549.	4.812	n a.
ARYT OPTRONICS n.c Optical lenses	n.c	n.c	1.500	

*For the year ending December 31,1988.

ISRAELI COMPANIES ON WALL STREET:

The above table shows that most of the companies enjoyed highly satisfactory business results. Jerusalem Post Business Reporter Judy Maltz, picked up our comments about a marked improvement in the shares of two leading Israeli firms - Scitex and ECI Telecom. It is not surprising that the market capitalization for these two companies has risen substantially since the beginning of 1989. In the first three months of the current year, ECI Telecom reported a net profit of \$1.0 million and achieved a net margin of 8.4%. Scitex with \$5.9 million in net profits, and a net profit margin of 11.4%, did even better. ECI Telecom, results are in line with our analysis of the company IHTR 2/89. The company's rationalization of its production facilities will further cut down expenses and ECI can be expected to deal more effectively with a mounting order book. Scitex's results for the three months of 1989 with a net profit of \$5.9 million reflect an all time profit high of any quarter in the company's books. Scitex's cash flow is strong and increasing. Its financial expenses have dropped dramatically in no small part as a result of the \$39 million equity investment by Robert Maxwell's Mirror Group PLC. Scitex's strategy of linking its key products to desktop publishing is generating increasing revenues for its core Visionary MacIntosh -based design system. A further expansion in Scitex business can be expected. Teva Pharmaceuticals had a net profit of \$4.9 million, and a healthy margin of 7.2%. Its results are connected to its Abic Ltd. acquisition and due to its expanding presence in the U.S. market via its subsidiary TAG. More excitement will be generated when the company receives FDA approvals for drugs which are now in the registration pipeline. The question is which of the companies and to what extent can they maintain or improve on these results? Since they are active in different

fields of business, generalizations fall short of the mark in explaining IHTR's generally positive view. Some recent fiscal developments in Israel will have a tendency to improve the results of all of these companies. The devaluation of the Israeli Shekel by 13.4% at the turn of the calendar year, as we predicted has had a strong and positive influence. In the past month the NIS reacting to the strength of the US dollar on the international currency markets has weakened by more than 3%. The companies incur part of their expenses in Israeli currency but sell mostly in U.S. dollars. The rate of exchange factor should continue to favorably effect their profitability Fibronics International Inc. has announced operating results for the March quarter. Three months revenues increased 26 percent to \$11 million as compared with revenues of \$8,8 million for the same period in 1988. Net profits were \$709,000, or \$0.11 per share, as compared with a loss of \$879,000, or \$0.15 per share, for the same period in 1988. The first quarter of 1989 is the fourth consecutive quarter in which revenues and profits have increased. Fibronics has just signed an agreement with Motorola Israel for the latter to serve as its marketing agent for the local market.

THE COST OF MONEY HURTS ELRON: Elron Electronic Industries reported a net loss of \$692,000. Elbit's contribution of \$1.6 million to the profit side was nearly wiped out by financing expenses of \$1.5 million. The results were impacted by the relatively low expenses of \$731,000 associated with new ventures and R&D.

ISRAEL HIGH-TECH REPORT INDEX

59.17 UP 7.10%

*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

(continued from page 3-A kibbutz...) stimulation is applied. For diffused pain covering an area the size of the palm on one's hand, whether in the shoulder, lower back it is the linear pathway to the pain area is important and multiple electrodes are employed using single channel or two channel stimulation.

Muscular pain can be treated either with the pain or with the relieving rehabilitation unit.

Transcutaneous Electrical

Stimulation (TES) is adopted and is being used by the Hadassah Pain Unit and the method has been applied since then to an increasing number of patients suffering from various acute and chronic pain syndromes.

Hadassah reports that the beneficial effects of TES are explainable by the activation of inhibitory mechanisms responsible for blocking pain transmission and leading to a reduction in the rate of discharge of impulses from the pain region to the brain and in an increase in the release of an opiate like hormones, the endorphines, which modify pain perception.

Hadassah practitioners point that it is impossible to predict definite outcomes with TES therapy. Yet its application for symptomatic pain relief is strongly indicated based on its clinical experience and its high rate of success without addictive potential or adverse effects.

At Kibbutz Ginosar INTR learned that year nearly 8,000 units of Agar's nonaddictive, non-invasive compact importable electronic muscles and nerve stimulators were shipped in 1988 to various destinations throughout the world. 85% of the sales going to the United States, 10% to Australia, Holland, and other parts of the world, 5% went to the small Israeli market.

Yehuda Schaik, the company's manager is examining diversification possibilities into other areas such as diagnostic monitoring and blood circulatory equipment. Kibbutz Ginosar in 1986 was the object of international attention when two of its members discovered a 2000 year old boat which was buried under mud on the nearby sea-shore. Studies of the boat have shed much information on the post-Jesus era.

MISSED OPPORTUNITY FOR CAPITALIZING ON R&D:

Prof. Eugene Rosenberg incumbent of the chair for applied microbiology at Tel Aviv University is known internationally for his work on oil micro-organisms to attack the problems of pollution. In the early 1970s Prof. Rosenberg attracted international attention when he developed the technique for the use of oil micro-organisms to get rid of oil slicks. This eventually was sold to an American firm, Petrofin, which has since then invested \$30 million in developing the product for the market. Tel Aviv University never did sign royalty agreements, yet \$1,000,000 has been received from the company in support of research grants.

RECENT DEVELOPMENTS

ELBIT BEGINS TRIAL PRODUCTION:

Elbit has started trial production of the IS-10, a sophisticated image processing and communication system that has passed field tests and attracted substantial customer recognition. The IS-10 transmits real time images of the battlefield to decision-makers, and distributes processed pictures, including text and symbols, to field forces. The state-of-the-art IS-10 uses any type of TV or FLIR camera as the image sensor, providing three major benefits. Specific frames can be frozen from the dynamic, monitored video input. Moreover, text and graphic symbols can be added to the picture, providing attack forces with clear information about detected and battlefield environment. Finally, existing radio nets can be employed for optimal distribution of the raw specific users. In addition, the system offers special digital communications and internal image library management features.

\$500 MILLION EXPORT SALES FOR I. A. I. ELECTRONICS :

The Electronics Division of Israel Aircraft Industries anticipates \$506 million in exports during 1989 compared with \$470 million in 1988. Exports constitute about 70% of the division's total sales. According to Moshe or-Tas, deputy managing director of I.A.I. and managing director of the Electronics Division, the Division's marketing success,

despite the Lavi project cancellation, is due to the development and export of a wide range of products and the business strategy adopted by the Division's affiliates. He notes that over the past five years, commercial links with European and U.S. markets has strengthened. Also new contacts have been formed with local industries and various branches of the Israel Defense Forces. A number of subsidiaries have been opened and technology transfer agreements have been signed. The Division defined certain target areas of operation and developed original products for its customers. The strategy according to the I.A.I. executors has generated orders worth \$1.3 billion which will provide work for the next two years. Approximately 32% of the Division's orders are intended for the American market, a three-fold increase over 1987. The increase in exports to the U.S. follows the signing of a number of major contracts with U.S. Armed Forces. Among the contracts are the Arrow Missile and a night-vision system for Supercobra helicopters used by the U.S. Marine Corps. The I.A.I. Electronics Division is planning to diversify even more in the coming years with the intention of penetrating the civilian market.

ELECTRONIC SEABORNE WARFARE SYSTEM:

Details concerning a new shipboard electronic warfare system, developed by Tadiran subsidiary Elisra Electronic Systems, were published in the last issue of the Israel Defense Forces-IDF Journal. Code-named NS 9003, the system is designed to gather military electronic information, can function in high risk situations and includes new systems with 'dialogue' capabilities. In addition to its passive information gathering, the NS 9003 can also activate a wide variety of electronic warfare systems.

AWARD:

Prof. Ephraim Katchalski-Katzir, distinguished Weizmann Institute researcher and Fourth President of the State of Israel, has just elected as a Foreign Member of the French Academy of Sciences.

SOREX CORPORATION - A STARTUP

Only 150 years have passed since modern photography was introduced by Messrs Daguerre and Fox Talbot. Prior to that for centuries the camera obscure--- a darkened chamber with one opening in one of the walls through which an image or external bright object was formed on a screen on the opposite end of the darkened chamber. Artists having difficulty with perspective have used the technique to project images onto a sheet of paper so that they could trace the correct outline prior to beginning to paint. In the past few decades the progress in the development of photography has centered more on consumer convenience than on basic development. Companies such as Polaroid, Bell & Howell and more recently the Japanese firms like Olympus and others have provided convenience and satisfaction to the user by creating new fields such as instant photography, and 35mm. film production.

The use of of chips and sensors have only more recently been adopted for various techniques and improvements in the art of photography.

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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The field of sensors, detectors in combination with optical lenses is relatively highly advanced in Israel. Most of the applications the result of applied research for use by the defense establishment and industries. The basic question whether a picture could and should more closely approximate the capability of the human eye has been the subject of research work at the Technion for more than seven years. [IHTR-5/89]. Sorex an American startup company has acquired the technology and it is seeking capital financing to advance its strategy of "obtaining a worldwide portfolio of patents relating to all aspects of the technology and to license the technology." Sorex inventors and entrepreneurs alike believe that they have the technological basis which offers a major improvement in the field of photography. Dr. Morris Weiberg who founded Fibronics in Israel in 1978 has put together an investment package aimed at raising capital to move the project into the hands of manufacturers. Sorex contains many of the features which IHTR features including the best of local R&D and capable entrepreneurial backing. For this reason we present a somewhat more detailed description of the project which Sorex believes "represents a significant enhancement to current common knowledge and accepted tradition of existing video cameras, image processing systems and computer vision".

The Technology

Sorex—a startup company believes that the primary result and benefit of the technology is to enable video cameras to provide performance comparable to that of the human eye. By gaining an in-depth understanding of the human vision system and advanced technological imaging capabilities, the developers of the technology have designed an electronic vision system which they believe mimics the human eye by incorporating two significant technological advances: "adaptive sensitivity" (visual data collection)

and "intelligent scan" (visual data selection). "Adaptive sensitivity" enables an electronic image sensor such as a video camera to capture an extremely wide illumination range of a scene while at the same time preserving substantially all of the scene's fine details and luminosity. This is accomplished by simultaneously capturing the entire image while dynamically setting correct exposure levels for each component of the image. "The "intelligent scan" mechanism selects all of the key areas of interest in the image and concentrates data transmission and in these areas. This reduces the amount of data transmitted to that which is relevant to the image. It is anticipated that these advances will be integrated in microelectronic form permitting direct incorporation into a video camera.

Sorex believes that its technology will provide a video camera, for example, with the ability to capture all of a scene's contents as seen through the viewfinder of the camera irregardless of lighting and other conditions, by incorporating two important mechanisms that are characteristic of the human visual system. These are adaptive sensitivity and intelligent scan. The business goal of Sorex is that the majority of its revenues will be generated from licensing fees, royalty payments and externally funded R&D contracts.

Dimotech, Mr. Sherman Wolf, Dr. Morris Weinberg and the Technion scientists entered into an agreement assigning all rights to the technology to the company.

Sorex believes that the technology represents a significant enhancement to current common knowledge and accepted tradition of existing video cameras, image processing system and computer vision.

A private offering is in progress to raise capital to move Sorex forward and towards achieving its business goals