

ISRAEL HIGH-TECH & INVESTMENT REPORT

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JOSEPH MORGENSTERN, EDITOR

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The Rabin Legacy

In the wake of the assassination of Israeli Prime Minister Yitzhak Rabin, more than 85 heads of state attended the slain leader's funeral in Jerusalem. President Bill Clinton delivered a moving speech and closed it with "Shalom ,haver [Farewell, Friend]". King Hussein of Jordan delivered the most moving eulogy, speaking of his "brother" in peace making. The fact that the leaders of the Gulf States also attended Rabin's funeral was nothing short of incredible (and inspiring). Many other world leaders, unable to attend, expressed their great respect, admiration and affection for Rabin. Close associates painted a picture of a dedicated man, a stickler for detail and planning, reticent and at his persuasive best in one-on-one meetings.

During my years of service in an Israeli Air Force reserve unit, I was never privileged to actually meet Yitzhak Rabin, but as the editor and publisher

of the *Israel High-Tech Investment Report* I was exposed to his philosophy and positive attitude toward entrepreneurial activity in general and Israel's high-tech sector in particular. Rabin viewed a strong economy as a necessity for peace. He once suggested that government-controlled businesses should be run more like high-tech industries -- creating exports for Israel while earning profits for themselves. He often spoke bluntly. "I am tired of visiting factories that are losing money, with managers turning to me for subsidies."

A personal transformation occurred during his tour as Israel's Ambassador to the U.S. There, he acquired many of his ideas relating to a free-market economy. Later on, as Prime Minister, Rabin



Daniel Morgenstern

He made Israel a part of the large world

adopted these ideas and transplanted them to the Israeli world of business. Rabin favored a market-driven economy for Israel; not all of his supporters agreed. However, it is likely that Shimon Peres, a seasoned politician will likely continue on the same road and move towards a free-market economy.

Despite this recent tragedy, Israel is showing its determination to maintain its rate of economic growth, and foreign investors (so far, at least) feel comfortable in the post-Rabin era.

Emerging Technology Center Attracts U.S. Watchmaker

"Come, live and work in Jerusalem!" former Mayor Teddy Kollek used to say when greeting newcomers to his city. For more than two decades, Kollek was the capital's most fervent and devoted pitchman. During his mayoralty, the Jerusalem Museum grew, as did the Hebrew University, the

Bezalel Institute of Art and the Jerusalem College of Technology. Yet Mayor Kollek was frustrated by Jerusalem's failure to attract more than a handful of industrial enterprises. For many years, local and foreign businessmen opted to build factories in the

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Editorial Offices: P.O. Box 33633, Tel Aviv 61336, Israel

Tel: 972-3-5235279 Fax: 972-3-5227799

greater Tel Aviv area or in other parts of Israel. In the late 1980s, the business climate for entrepreneurs improved. Investment grants and tax concessions, along with an expanded and upgraded infrastructure, were powerful lures. Intel, the giant American semiconductor company, began to prosper at its Jerusalem site, and General Manager Dr. Dov Fruhman praised the city as a first-class location for the plant. Intel's facility in Jerusalem employs 1,500, and many of these employees are holders of second and third degrees. "We've had no trouble finding skilled workers in Jerusalem," Fruhman stated.

The 1993 Madrid Conference sent another powerful pro-Jerusalem message to international business people seeking to establish a presence in the Middle East.

The two-year-old peace process opens new possibilities for multinational companies, and Jerusalem today is seen as an ideal entry point into the region.

The personable young Ehud Olmert, who succeeded Kollek as Mayor, points to solid achievements, including modern technology centers occupied by expanding electronic firms ably staffed by local professionals, of which many are highly skilled immigrants from the former Soviet Union.

Timex Arrives

Timex, the big American watch manufacturer based in Danbury, Connecticut, did not fail to recognize the winds of change sweeping across the Middle East.

"We think globally but, up until now, it has been difficult to do business in the Middle East," observed Vice-President Muhammad Salem. Timex intends to "put high-tech into watches," according to Salem.

The company has a sharp interest in opening a research and development facility in Jerusalem, said Aaron Etra, a principal of Investors and Developers Associates Inc. The New York City-based consulting firm undertook to implement an April 1995 decision by Timex's board of directors to establish an R&D facility in Israel's capital, and offered a turnkey solution. In September, a full-scale research facility in the Manhat Jerusalem Technology Park was officially opened, with a festive ceremony attended by Mayor Olmert. The staff of six scientists (including engineers and physicists) has already grown to nine.

"Timex insisted that Jerusalem is the best location for doing business in the Middle East," recalls Etra. Timex was simultaneously opening a regional sales and marketing office in Dubai. Several Dubai executives are scheduled to arrive in Jerusalem in December to acquaint themselves with the work of

the R&D facility.

"Israel offers an ample supply of highly skilled manpower, a potential for growth in a politically stable environment and a range of government incentives, which creates an ideal environment for investors and entrepreneurs," says Dan Vilenski, executive director of BIRD, the Israel-US Binational Industrial Research and Development Foundation. The Foundation, with its \$110 million endowment fund supplied by both countries, funds 50% of the development costs of Israeli-based partnerships with American companies. Timex's request for funding of a full-scale R&D facility in Jerusalem was approved by BIRD's board. Though the amount of the Timex grant was not made public, full-scale project grants, according to BIRD regulations, can be as high as \$2.5 million.

Bromine Project Launched at the Amman Conference

A preliminary agreement between the Dead Sea Bromine Group (DSBG) and the Arab Potash Company (APC) detailing the establishment of an Israeli-Jordanian joint venture to produce 25,000 tons of bromine per year was signed at the recent Middle East - North Africa Economic Summit in Amman. As a result the Middle East Bromine Company, is now being formed, with an initial capital outlay of \$50 million. The new company will be located on the Jordanian side of the Dead Sea. All details will be finalized by April 1996. "We are very optimistic that this project will materialize, since both governments are intent on moving ahead," Dr. Ehud Fuchs, Chairman of the Dead Sea Bromine Group (DSBG), told *IHTIR*. DSBG operates an elementary bromine plant at Sodom, on the Dead Sea. It is one of the world's major producers of bromine and bromine compounds; its production accounting for more than 30% of the world's total output.

In 1994, DSBG sold \$365 million of bromine products. Output for 1995 is expected to exceed \$400 million as demand for bromine continues strong.

Bromine produced by DSBG is derived from natural brines. Natural bromine is processed into products such as sodium bromide, calcium bromide, lithium bromide and zinc bromide, among others. These products have many applications in industry and agriculture as the basis of flame retardants, organic catalysts, chemicals used in water treatment and oil drilling, photographic products, cosmetics and pesticides.

Both Israelis and Jordanians have been extracting potash from the Dead Sea for many years. The Dead Sea Works produces 3.2 million tons per year, while its Jordanian counterpart, Arab Potash Company (APC) produces 1.8 million tons.

Several years ago, contacts began between Fuchs, then Senior Vice-President of the Dead Sea Works, and Suleiman Hawari, Managing Director of APC. "Our knowing each other was instrumental in making possible the most recent joint venture program," said Fuchs, who along with Hawari, signed the preliminary agreement, subject to final approval.

"I cannot discuss details now because the planning is ahead of us," Hawari told the *Israel High Tech and Investment Report*. The size of the plant and the personnel needed will depend on how many bromine derivatives will be produced. We aim to conclude the planning sometime in the next six months," Hawari told IHTIR.

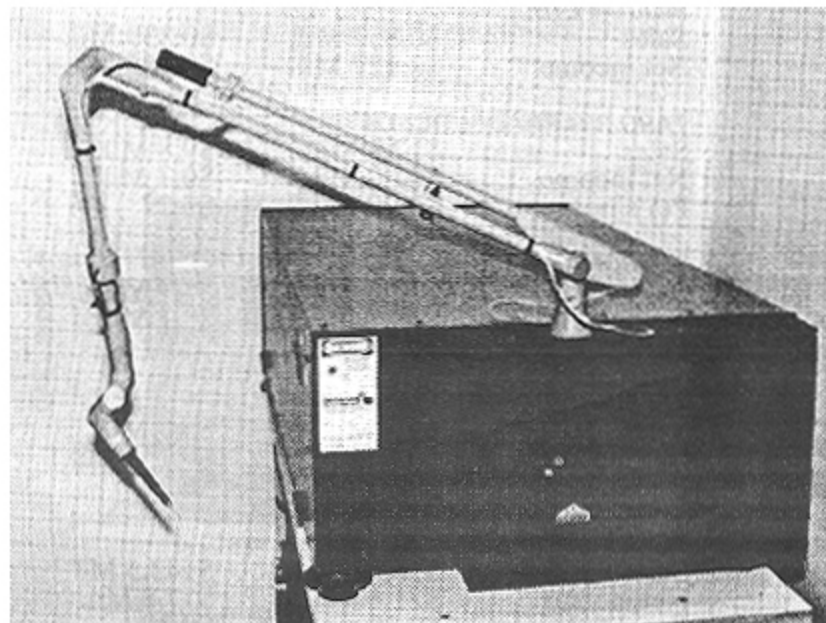
"Our deal to establish a joint bromine company was the first deal of the conference."
-- Dr. Ehud Fuchs, Chairman of DSBG.

New Laser Improves Prospects of Restoring Sight

A new laser delivery system may soon restore eyesight.

An ingenious method of delivering the light of an excimer laser to the back of the eye could herald a major advance in the treatment of detached retinas, which can lead to total loss of sight.

Several years ago, British Prime Minister Margaret Thatcher was experiencing detached-retina



problems. Her affliction received worldwide attention, and Dr. Richard Packard, a British eye surgeon, successfully performed delicate surgery, cutting the membranes which grew over the retina, and were forcing it to become detached. In those

days, the procedure was done with the usual operating equipment such as scalpel, scissors and tweezers.

Now, a new and more precise method is being applied at Hadassah Medical Center in Jerusalem. Working under Prof. Aaron Lewis, an internationally acknowledged researcher, Dr. Daniel Palanker, 35, has devised a system that allows the precise cutting of membranes.

"The invention is not a new excimer laser because these have existed for some time. In Russia, they are widely used in sculpting the cornea to alleviate acute shortsightedness. We did, however, devise (by first testing on animals and then on humans) a new delivery system which overcomes the problems of a liquid environment such as that inside the eye, and gives precise control to the surgeon while cutting membranes near the retina.

"Our contribution to the field is the development of a tip which can withstand the energy created by the excimer laser, which has a wavelength of 193 nanometers. Under these conditions, our unit removes layers that are less than 1 micron thick," Palanker said.

The NanoMed Company has been formed to commercialize the system. Namomed showed its product to the BIRD Foundation, which provided seed money for development. The American firm Summit Technologies, one of the largest manufacturers of excimer photorefractive lasers, will cooperate in developing mass production methods and facilitating sales for the new system, the market potential of which is estimated at several hundred million dollars. "To make the unit more acceptable to surgeons, our thinking is that it should be miniaturized," Palanker said.

Clinical trials have already begun in Israel, and ten operations have been successfully carried out. Clinical trials will begin in the U.S. in 1996, aimed at obtaining approval by the U.S. Food and Drug Administration. A graduate student in theoretical physics, Palanker emigrated to Israel from Russia in 1987.

"There were no opportunities for theoretical physicists, so I turned to activities where a knowledge of physics could be applied," he explained. Palanker set out to earn his doctorate under Prof. Lewis's tutelage, and it was during this period that he developed the system.

Markets Remain Stable In Aftermath of Rabin Killing

There are no signs of instability on any of the financial markets following the assassination of Israel's Prime Minister. On Sunday, November 5,

FINANCIAL RESULTS THIRD QUARTER 1995

	1995	1994		1995	1994
ACCENT SOFTWARE INTERNATIONAL			LANNET DATA COMMUNICATIONS		
Sales	\$1.3 Mil.	\$0.141 Mil...	Sales	\$27.5 Mil.	\$18.0 Mil.
Net Income	(\$1.5 Mil.)	(\$0.94 Mil.)	Net income	\$3.3 Mil.	\$1.9 Mil.
Per share	(\$0.30)	(\$0.31)	Per share	\$0.28	\$0.18
A.G. ASSOCIATES (full year)			LANOPTICS LTD.		
Sales	\$62.7 Mil.	\$40.2 Mil.	Sales	\$17.7 Mil.	\$14.8 Mil.
Net income	\$9.8 Mil.	\$3.2 Mil.	Net income	\$3.3 Mil.	\$2.1 Mil.
Per share	\$2.06	\$0.87	Per share	\$0.20	\$0.13
ALADDIN KNOWLEDGE SYSTEMS LTD.			LASER INDUSTRIES LTD.		
Sales	\$2.6 Mil.	\$1.6 Mil.	Sales	\$12.6 Mil.	\$9.3 Mil.
Net income	\$0.762 Mil.	\$0.542 Mil.	Net income	\$1.6 Mil.	\$1.1 Mil.
Per share	\$0.11	\$0.08	Per share	\$0.26	\$0.18
AMPAL AMERICAN INC.			MAGIC SOFTWARE ENTERPRISES		
Sales	\$20.1 Mil.	\$24.2 Mil.	Sales	\$6.3 Mil.	\$5.3 Mil.
Net income	\$4 Mil.	\$3.8 Mil.	Net Income	\$0.13 Mil.	NA
			Per share	\$0.03	(\$0.24)
BIOTECHNOLOGY GENERAL			NETMANAGE LTD.		
Sales	\$5.1 Mil.	\$1.9 Mil.	Sales	\$32.7 Mil.	\$16.6 Mil.
Net income	\$0.584 Mil.	(\$4.5 Mil.)	Net income	\$7.9	NA
Per share	\$0.01	(\$0.12)	Per share	\$0.19	\$0.10
ECI TELECOM			PEC		
Sales	\$111.4 Mil.	\$99.2 Mil.	Income	\$11.9 Mil.	\$12.5 Mil.
Net income	\$22.5 Mil.	\$19.5 Mil.	Net income	\$8.9 Mil.	\$9.5 Mil.
Per share	\$0.30	\$0.26			
ELBIT COMPUTERS			SILICOM LTD.		
Sales	\$238.5 Mil.	\$170.6 Mil.	Sales	\$0.857 Mil.	\$0.839 Mil.
Net income	\$3.3 Mil.	\$10.2 Mil.	Net income	\$0.127 Mil.	\$0.185 Mil.
Per share	\$0.15	\$0.55			
ELRON ELECTRONIC			TARO PHARMACEUTICALS		
Sales	\$333.0 Mil.	\$273 Mil.	Sales	\$12.8 Mil.	\$9.8 Mil.
Net income	\$2.4 Mil.	\$2.3 Mil.	Net income	\$0.00 Mil.	\$0.7 Mil.
Per share	\$0.12	\$0.12	Per share	\$0.00	\$0.07
ELSCINT LTD.			TECNOMATIX TECHNOLOGIES		
Sales	\$73.3 Mil.	\$59.0 Mil.	Sales	\$7.9 Mil.	\$5.9 Mil.
Net income	\$3.8 Mil.	\$3.2 Mil.	Net income	\$1.2 Mil.	\$0.7 Mil.
Per share	\$0.05	\$0.04	Per share	\$0.14	\$0.09
GEOTEK			TELEDATA COMMUNICATIONS		
Sales	\$20.9 Mil.	\$17.6 Mil.	Sales	\$9.2 Mil.	\$5.7 Mil.
Net income	(\$21.2) Mil.	(\$12.6) Mil.	Net income	\$0.544 Mil.	\$0.138 Mil.
Per share	\$0.43	\$0.26	Per share	\$0.05	\$0.01
GILAT SATELLITE COMMUNICATIONS			TEVA PHARMACEUTICAL		
Sales	\$11.5 Mil.	\$7.4 Mil.	Sales	\$165.3 Mil.	\$143.5 Mil.
Net income	\$2.3 Mil.	\$1.7 Mil.	Net income	\$21.6 Mil.	\$17.8 Mil.
Per share	\$0.27	\$0.21	Per share	\$0.39	\$0.32
INDIGO			TOWER SEMICONDUCTOR		
Sales	\$43.2 Mil.	\$25.7 Mil.	Sales	\$26 Mil.	\$15 Mil.
Net income	(\$14.5) Mil.	(\$2.9) Mil.	Net income	\$5.7 Mil.	\$2.0 Mil.
Per share	\$(0.28)	\$(0.06)	Per share	\$0.44	\$0.29

the day after Rabin's killing, the General Share Index declined 2% -- a correction -- but there was no evidence to support some Israeli newspaper reports that ascribed the drop to selling by foreign investors. Turnovers were in keeping with those of the preceding fortnight and trading was orderly. The management of the exchange kept the market open and curtailed trading only on Monday the 6th as a sign of respect during Rabin's funeral in Jerusalem. Had Israel lost its credibility in the eyes of foreign investors, it would have been felt immediately. In the third quarter of 1995, foreign investment on the Tel Aviv Stock Exchange reached \$130 million and, in the first three quarters of the year, \$358 million, according to statistics from the Bank of Israel. In addition, foreigners invested \$329 million in Israeli companies traded outside Israel.

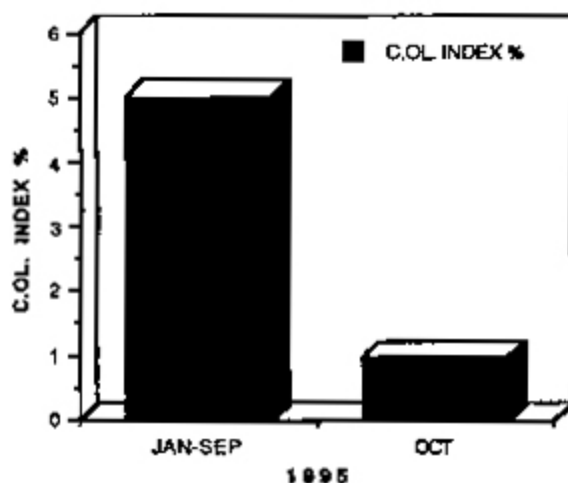
It has been a record year for foreign investment in Israel, with a total of \$1.5 billion in direct and securities investments in the first nine months, compared to \$900 million in all of 1994.

Trading in foreign currency resumed on Monday, the first day of the week for currency trading. On Monday (the day of the state funeral), trading activity was normal. There were no indications of unusual movements away from the Israeli shekel to the dollar or other foreign currencies, according to a spokesman for the Bank of Israel, which supervises foreign currency trading.

Consumer Price Index Rises 1%

The consumer price index for October rose 1% -- in line with forecasts by banks and economists. Strong

COL INDEX 1995



demand developed at the weekly tender for the Bank of Israel NIS 70 million shekel Gilon unlinked bonds. The demand for the tender, which took place several hours before the announcement of the consumer price index indicates that the market is not expecting any imminent increase in the rate of

interest. Further support for this assumption came in the announcement that the amount of money in circulation declined by 3.4% in October.

ISRAELI COMPANIES ON WALL STREET

Investment Banker Lehman Bullish on Teva

In a recently published paper, Lehman Brothers estimates that Teva will report 1996 earnings of \$2.85 a share, which will include \$0.50 per share from sales of Copaxone. Lehman projects a share price of \$70 within 12 to 18 months. The assumption behind this rosy projection is that Teva's growth will jump from 18% to 50% a year after Copaxone sales begin.

Expectations are that the U.S. Food and Drug Administration (FDA) will make its position known on the Copaxone application by April 1996. Teva's British application for Copaxone appears to be moving ahead without difficulties, and approval is expected in January 1996.

Internet Excitement Responsible for Jump in Share Prices

In the first week of November, attention shifted on the American markets from the shares of semiconductor companies to those which are Internet-related. The shares of Netscape, which has produced a simple-to-use program for browsing the Internet, exceeded \$100 each. The programs offered by the company presently account for 70% of the software used for Internet. Netscape's shares were first traded August 9, 1995, at \$57 a share, which was twice its offering price (it has gone up by 70% since its issue).

Shares of the Israeli company Accent Software International Ltd. (NASDAQ: ACNTF) were issued as part of an Initial Public Offering on July 20, 1995, at \$6.50 per share and 10 cents per warrant. The shares by the end of October traded at about \$14. Subsequently, the company presented itself at a technology conference in Tel Aviv at which IHTIR was also present. We were impressed by the new multilingual browser with total support for Japanese. This unique product allows Internet users to browse the World Wide Web in more than 30 languages, using any language version of Windows.

Bezeq Bids for Indian Project

Israel's state-controlled Bezeq Telecommunications Ltd. (TASE:BEZEQ) is a 26% partner in a consortium bidding for a big project in India. The consortium also includes a Thai company, the Indian HFCL, and two Indian financial companies. The project, valued at several billion dollars, is aimed at providing a modern telecommunications system for India.

Morgan Stanley, the American investment banker, has offered its services to underwrite a stock issue on behalf of the consortium.

ECI Telecom's Book-to-Bill Ratio 1.56: 1.00

ECI, at the end of third quarter of 1995, has an order backlog of \$174 million, the highest in its history. The backlog does not include a \$60 million contract in China, first announced on September 28.

Investment banking circles have forecast 22% growth in the fourth quarter, or \$0.33 per share.

Indigo Shares Lose 39% in One Day

In a public profit warning and in a letter to shareholders, Indigo's founder, Chairman and CEO Benny Landa, announced that in spite of previously announced expectations of a profitable third quarter, Indigo would record losses of about \$14 million in each of the third and fourth quarters of 1995.

Shortly afterwards, the company reported a \$14-million loss for three months ending September 30. Have Indigo shares been overrated and overhyped? Probably. American investment banker Lehman had advised its customers that they could expect Indigo to earn \$0.93 per share in 1995.

When the bad news announced, investors bailed out and, on a massive turnover of 2.7 million shares on October 30, their price fell by 39% to \$10 -- the lowest level since Indigo's initial public offering in 1994, when it came on the market at a valuation of \$1 billion.

At one point in July of this year, shares peaked at \$64, giving Indigo a value of \$3 billion.

It is too early to declare Indigo a fallen star, but some wonder whether the management is out of touch with the marketplace. Indigo has broken into the short run color market and reports that it has installed 500 machines worldwide. If the company's losses continue at the projected rate, Indigo may reach in 1996 a negative equity position.

Elsclnt's Medical Equipment in China

Elsclnt, Israel's major producer of computer-based medical imaging systems, signed a letter of intent with China National Medicines & Health Products Import and Export Corporation during a recent visit to Israel by China's Minister of Foreign Trade & Economic Cooperation. When finalized, the order will include 15 CAT scanners, 10 magnetic resonance imaging systems, and 10 nuclear medicine cameras, as well as several mammography systems. The equipment is valued at approximately \$30 million.

Robertson-Evergreen Tech Conference

A big technology conference was held November

5-6 in Tel Aviv. Jacob Burak, managing director of the Evergreen Group, and Chairman Sandy Robertson, of Robertson, Stephens & Co., decided to hold the conference despite the fact that it was scheduled to open the morning after the assassination of Israel's Prime Minister. Attending the conference were the technology research analysts from Robertson Stephens America's leading investment banker for underwriting public issues of high-technology companies. Forty-two Israeli-based or related public high-tech firms showcased their products to delegates from Europe, the U.S. and Israel.

More than 700 people attended the two-day event, which also presented 29 private companies, all possible candidates for IPOs. (Anyone wishing to obtain further information may write to *IHTIR* and we will forward the inquiry to the appropriate individual.)

Among the private companies, most of the technology on display was computer-related, including unique signal processing, algorithm-based products, CAD/CAM systems, a variety of software operating applications, computer security products, solutions for full-text multimedia databases on CD-ROM, Internet working software tools, image processing, educational software, patient monitoring systems, ultrasound medical care systems, commercial Internet access and service providers, digital video compression and decompression equipment, real-time video processing systems, equipment for the semiconductor industry, LAN switches, wireless LAN products, processes for microchip design, and audio and voice data organization networks.

From among these firms will likely emerge the next wave of public companies representing the key sectors of Israel's high-technology expertise. (*IHTIR* will contact these and other private companies currently seeking financing, once they move past the prototype stage or are actively marketing their products.)

Israel's Executive Plane

Isravation Ltd. has told *IHTIR* that its ISST-50, five-seat, pressurized, executive aircraft has 40 hours of accrued flying time. The company's marketing strategy is for direct and time-sharing sales.

An engine problem in the test flight prevented the plane from showing up at the international airshow at Le Bourget (France) last June. However, management reports it was able to attract buyers to its Kiryat Shmona plant and orders have been placed. A second prototype is under construction, with each component certified by the American aviation authorities.

A new plant being built for the production of these \$1 million planes should be completed by year's end.

XTL Biopharmaceuticals Ltd.

XTL Biopharmaceuticals Ltd. (formally Xenograft Technologies) is in the midst of a \$5 million financing. The funds are being raised by a small American company specializing in the biotechnology field, and by institutional investors. The company's next milestone, expected by year's end, will be the characterization of its fully human antibodies for hepatitis-B.

"After that, we will work on upscaling it and then put it through clinical tests," says Chief Operating Officer Dr. Z. Berger.

The three-year-old firm focuses on viral and auto-immune diseases by employing an engraftment technology which produces chimeric mice with functioning human immune systems. The technology is based on the work of Prof. Yair Reisner of the Weizmann Institute.

Since our report at the outset of 1995, XTL has created a corporate partnership for its hepatitis-C program with BioChem Therapeutics Inc., a subsidiary of BioChem Pharma Inc., a public company, to explore the use of the mice as a model for testing drugs against the hepatitis-C virus.

A spokesman for BioChem said the XTL model is the only in vivo one available for hepatitis. The industry is searching for a reliable screening tool, according to the spokesman.

BioChem Pharma's stock is trading at \$34. BioChem Pharma is developing anti-viral compounds and its HIV compound is under regulatory review. Its compound for hepatitis-B has shown good results in late stage trials.

Why the Mongoose Is Successful In Defeating Snakes

It was Rudyard Kipling who wrote that a mongoose's "business in life was to fight and eat snakes". Weizmann Institute researchers have published a report that reveals the molecular mechanism that allows the mongoose to fight these reptiles without being afraid of their deadly venom. The venom of some snakes is lethal in even small amounts because it interferes with signals sent by the central nervous system to various body cells. Some of the toxins contained in the venom act by attaching to a protein known as the acetylcholine receptor, which is present in the membranes of cells and plays a crucial role in nerve-muscle communication.

The Weizmann Institute research team investigated why these toxins do no damage to mongooses, or to the snakes themselves for that matter. They found

that in mongooses, the structure of this receptor differs from that of other animals and humans. As a result, snake venom simply bounces off the muscle cells of these small mammals, causing them no harm. The same structural difference in the receptor is found in snakes.

The research was backed by the Israel Science Foundation and the Muscular Dystrophy Association of America.

Herbamed Begins Exports

Herbamed Ltd., which produces and develops natural products, has begun marketing them for export, notably to the U.S. A product made from a base of locally grown cactus is recommended for the relief of conditions resulting from benign prostate problems.

In the first half of 1995, the company's efforts resulted in trial orders. By the third quarter, the company had exported \$80,000 and, according to company sources, expects to increase its exports significantly.

If sales goals are met for 1995, the company will likely seek additional private funding in 1996. Herbamed is privately owned, with majority control held by founder Dr. Haim Aviv. Institutional and private investors participated in the company's financing in 1992.

New Biosensor Technology for Monitoring Diabetes

A development-stage biotechnology company Carmel Biotechnology, based in Haifa, will soon submit for clinical trials its unique, patch-applied biosensor device which monitors and sounds an alarm to diabetic patients, warning them of impending hyperglycemia or hypoglycemia.

But first, some background
Diabetes, which may lead to coma, deterioration of vital organ function and death, is hardly a new disease. It has been known for at least 22 centuries and was given its name by Aerateu of Cappodocia in the 2nd century A.D.

He described it as follows: "Diabetes is a strange disease that exists in the flesh and consists of bones running together into urine."

In 1909 two physicians based in France, O. Minkowski and Baron J. von Mering, removed the pancreas from dogs and discovered a strange phenomenon: flies were attracted to the urine. Analyzing the urine, they discovered a high level of glucose, so the search for an anti diabetic substance began, in the belief that it was secreted from the pancreas. Dr. Frederick Banting earned lasting acclaim when he extracted insulin from a dog's pancreas and found that injecting the insulin into a diabetic reduced the patient's glucose level. Initial

applications consisted of insulin derived from cattle and swine. This has been nearly universally replaced by synthetic insulin produced by recombinant DNA techniques.

Current monitoring techniques

Diabetics the world over are now taught to monitor their own blood glucose levels. They do this by taking their own blood sample three times a day, smearing the blood on a paper, inserting the paper into equipment the size of a beeper, and reading out the glucose level.

"Patients can live a symptom-free existence for decades if they follow the correct regime," says Dr. Leslie Karpel, whose wife and son are diabetics: "The key issues are compliance and self-control, understanding the problem, and the ability for

technology. Children, old people and primitive populations will thus benefit, and the healthcare system will become more efficient. According to an article in the *New England Journal of Medicine*, the annual cost of treating diabetics is \$30 billion. Even a small percentage saved becomes meaningful," Karpel observes.

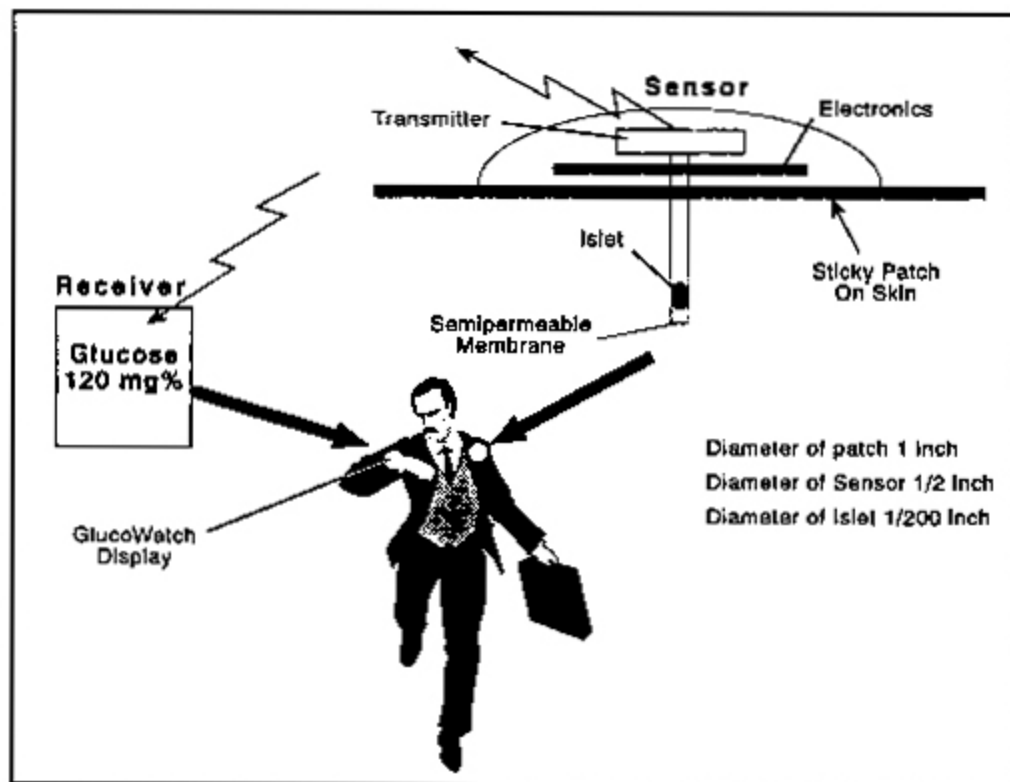
The stages of development

In 1989 Israeli researcher Professor Yoram Palti, a biophysicist who simultaneously earned his Doctor of Medicine and Doctor of Philosophy at the Hebrew University of Jerusalem, took a three-year sabbatical from the Technion and applied himself to developing a novel idea for monitoring diabetes, one that would eliminate the need for taking blood samples. Once he had developed the concept, he

founded Carmel Biotechnology in 1992. The product under development is a device that will warn diabetics of impending hypoglycemic shock. The warning signal will come in adequate time to allow them to take precautionary measures and reduce the risk of coma or death.

Which brings us back to Carmel Biotechnology and its new sensor.

The Carmel device is a skin patch with a hair-sized probe which is inserted into the subcutaneous tissue of the upper arm or abdomen. The patch contains all the electronics needed to process the electrical signals generated by beta-cells. These signals are used to calculate blood glucose levels, and sound an alarm when the reading exceeds preestablished upper and lower limits.



The Carmel Biotechnology Biosensor for measuring Blood Glucose

self-examination."

Karpel feels that replacing a patient's need to take his own blood sample will revolutionize the treatment of diabetes. "Some patients deny having the disease and are angry about taking their own blood samples. They do not want members of their family to see them drawing blood. Also, the current monitoring test is cumbersome, painful and emotionally disturbing. These are some of the negative psychological aspects related to the atavistic ceremony of drawing blood. There is great psychological relevancy for developing a new

The technology
The new patch thus enables diabetics to control their blood glucose levels easily, safely and reliably. It uses a sensor containing animal-derived beta cells in a bio-compatible microcapsule to measure blood glucose levels.

The technology is based on the discovery that beta cells respond electrically to the surrounding glucose concentration. The Carmel sensors are able to measure the varying electrical responses. Carmel intends to produce the devices in Israel. Chemical giant W.R. Grace is interested in the device, and has agreed to jointly develop the

membrane component.

"The membrane will be manufactured by W.R. Grace, our research partner, and they will subsequently supply our membrane needs," Karpel explained. "The joint development research project between Carmel Technology and W.R. Grace is one of the best examples of what we call a fruitful, full-scale development project, which we agreed to finance in 1994," says Dan Vilenski, executive director of the BIRD Foundation, which last year approved \$10.1 million to finance 28 projects in Israel.

How will the results of the patch tests be recorded and made available to the patient?

Professor Palti explains that the user will wear a kind of "watch" on his wrist. The watch will be able to read the test results of the glucose blood level. The scientist expects that clinical tests will begin in late spring, and that the product will be available within three years.

How optimistic is Professor Palti about meeting Carmel's goals and timeline?

"I believe that we have the right technology, and what remains to be established in the clinical trials is the reliability and accuracy of the product." Along the road to commercial success, there will be competition. Ten development companies are working to market a substitute for the current system. American BioControl Technology, for example, has developed a sensor based on infrared rays. Others are working on systems using various chemical and physiological approaches.

"We know what they're up to," Carmel's Dr. Shlomo Lefkowitz says of the competition. "They generally use chemical and physiological systems. We are the only ones to use biological material, which is considered to have the most advantages."

In One Year

Foreign companies are buying into Israeli technologies. Who is next?

- The Dutch software giant acquires Lannet Data.
- Intel acquires Shany
- 3 COM acquires Nyscom
- America OnLine acquires Ubique
- Cisco Systems is interested in LanOptics

Strategic Relationships with foreign companies

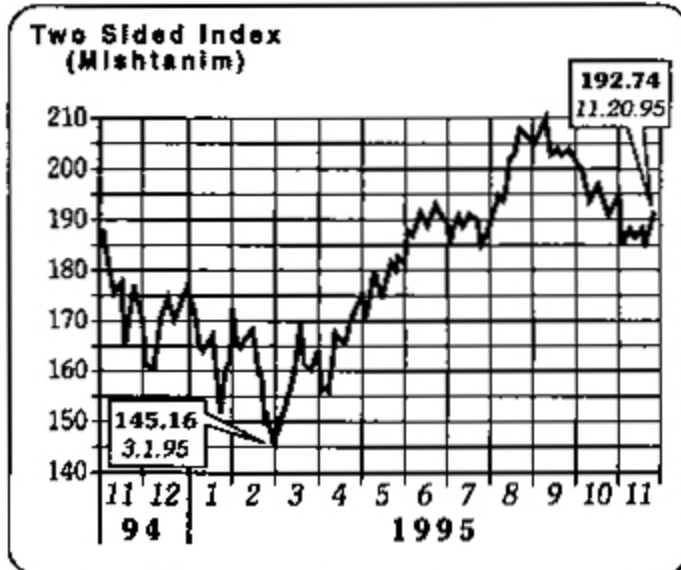
- Gilat Satellite Technologies with General Electric and Comsat
- Geotek with Hughes Network Systems and Mitsubishi

Eleven of the above have appeared in the pages of our newsletter. We must agree with many who point out that the successful operations of Motorola and Intel have been largely responsible for Israel becoming a power in telecommunications and

computer sciences. Their own stringent demands for the most qualified personnel, while providing American-level salaries, are attracting young people to study these specialties. The notable achievements of these companies are incalculably aided by investment and R&D grants.

Update With American Venture Capitalists

I recently met some longtime friends who were visiting Israel on business. Dr. Halley Faust was pleased with the development of his investments in Israel. His \$9 million fund, Medmax Ventures L.P. based in West Hartford, Connecticut, is currently



helping an Israeli start-up go public.

In the early 1990s, Halley spent a year in Beersheba, and met with most of the startups in the medical field.

Harlan Jacobs, who heads the Minneapolis-based U.S. Investors Ltd. and is a successful venture capitalist in Israel, has recently formed a new venture -- the Genesis Fund. The fund has 25 partners, each investing \$25,000. The fund invests in high-tech in Minnesota, but has also supported a number of Israeli companies, including Combact Technologies, Aliroo Ltd., JOLT, C.I. Systems and Medsoc Ltd.

Pixel Multimedia Ltd.

Pixel, a company specializing in three-dimensional animation and multimedia technology, may go public in 1996, after having entered into a major strategic relationship with Compaq of the U.S. Pixel has also joined forces with Multimedia and Mattel; this venture will result in computer toys for Mattel's Fisher Price division. Pixel has also entered into joint ventures with GT Interactive of the U.S. and Imagineer, Japan's giant multimedia publisher.

Pixel has purchased the rights to the Dead Sea Scrolls from the Israel Antiquities Authority and, backed by financing from Logos Research, has released a CD-ROM entitled "The Dead Sea Scrolls Revealed." Earlier this year, the company established a wholly-owned subsidiary in the U.S.

The Diagonal System for Shekel/Dollar Relationship

The Diagonal System a convention established by the Central Bank for maintaining the shekel rate of exchange within predetermined limits was announced in December 1991 and at a $\pm 5\%$ range against a basket of currencies.

This convention for the shekel rate of exchange was adjusted on May 31, 1995. Previously the Bank of Israel and the Treasury established a \pm of 5% allowable movement of the exchange rate from a midpoint. The May changes called for broadening the allowable movement to $\pm 7\%$.

The shekel dollar exchange rate has been stable since the beginning of 1995 in spite of calls by the Manufacturers Association and the Chamber of Commerce to effect a real devaluation of the shekel. The Associations assert that the profitability of dollar export sales has been harmed and that a stable rate of exchange will not shrink the yawning deficit in the balance of payments which could exceed \$3 billion by the end of 1995. For 1995 and including October the rate of inflation in Israel was 6% and economists project 8%-9% for all of 1995. However, the Governor of the Bank of Israel has expressed his opposition. Any sizable adjustment in the rate of exchange would worsen Israel's rate of inflation.

Toward the end of November, the dollar strengthened, in keeping with its rise on the international currency market. Demand by local investors speculating on a wider move in the rate of exchange boosted the rated in four days from 3.035 to the dollar to 3.095.

"There is visible speculative demand for a lower shekel, but I believe that the Bank of Israel will not change its policy and it will allow the shekel to retrace its loss," said Nahum Stolaro, head of the investment department at Union Bank.

Israel-Egyptian Contacts Warm Up

Thirty Israeli and Egyptian industrialists are scheduled to meet at the end of November at Taba for discussions aimed to determine joint cooperation in the field of agro-culture and textiles. For the first time, the Egyptian minister responsible for economy and public companies will attend a joint meeting of Israeli and Egyptian businessmen. Dan Propper, president of Israel's Manufacturers Association will lead the Israeli group. Muhman Farid Hamis, the chairman of the Confederation of

Egyptian Industries will be heading the Egyptian group.

Claridge Profits From ECI Share Sale

Claridge Investments reduced its shareholdings this month in ECI Telecom to 11.2% when it sold on the open market 2,300,000 shares for \$46.3 million dollars. Claridge is said to have sold the shares as part of its tax planning strategy and not because it has changed its mind about the quality of its investment. Though Claridge's remaining holdings in ECI Telecom have a market value in excess of \$170 million.

Germany to Invest \$30 mil. in Gaza

The German government has promised to make available \$30 million for the establishing of an industrial park in Gaza or at other location on the West Bank. This was reported by the Palestinian Authority's Abu Ela, in charge of economic affairs, to Director-General of Israel's Foreign Ministry Uri Savir. It was learned at the meeting, which included American Dennis Ross, presidential advisor on Middle East affairs, that two industrial parks are already being erected in Gaza and Jenin.

Netmanage, EFI and Converse Cited by Forbes

Forbes in an issue which was published early November, ranked the world's 200 leading companies. The criteria for appearing in the list were based on a five year record which included: a minimum annual return on the price of the shares of 12.4%, annual growth in profits of 8% and annual rise in sales of 15%.

Three Israeli, or Israeli related companies appeared on the list for the first time. Netmanage was ranked 78 with an annual return on its shares of 21.5%, including a 23.4% return over the past 12 months. The company achieved a 140% average growth in profits in the past five years.

EFI was ranked 144 and recorded a 16.1% annual return on its shares including a return of 24.8% over the past 12 months.

Converse (Efrat Future Technologies) was ranked 188 with an annual return of 13.2%.

On Forbes listing of the leading companies outside of the U.S. two Israeli firms were cited: ECI Telecom and Tower Semiconductor.

Equities and Convertibles Rise by 7.5%

The value of the equity and convertible debenture market were reported to be NIS 106.2 billion (Nearly \$35 billion) at the end of October. The total was 7.5% higher than at the beginning of 1995.