ISRAEL HIGH-TECH REPORT

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JOSEPH MORGENSTERN, EDITOR

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From the Editor

THE MIDDLE EAST AND WATER

Threats of violence are not unusual in the Middle East. Generally they are connected with the Arab-Israeli political issues of which there are many. Now a new issue is emerging - an increasing water shortage in the area. In the not the so distant future, this may spark off a major crisis between Israel and its neighbors. It already appears as a potentially critical issue in Israel.

Recently the ministers of Iraq, Syria and Turkey met in Ankara to discuss the distribution of the waters of the Euphrates River which originates in Turkey. Water is becoming an ever more important factor in the politics of the Middle East. Oil cannot be drunk or used for agriculture so the distribution of the water in the ME has the potential to become the source of a ME conflict, oil notwithstanding, being the more strategically important commodity. Sensitivity to the control of water supply was noted in Iraq's reaction to Turkey's closure of the flow of the waters of the Euphrates River. The temporary stoppage occurred during Turkey's major project, building 21 dams on the upper Euphrates River. This concern regarding the flow of water to Syria and Iraq from the Euphrates will continue to be an important feature of the political relations between the two Arab countries and Turkey.

Israel's growing need for water was recognized by Israel's neighbors more than a quarter of a century ago. At the 1964 summit Conference in Cairo, it was decided to deplete the waters flowing into theJordan River which feeds Israel. Lebanon and Syria began to dig canals to divert the Hizbani in Lebanon and the Banias in Syrian to Jordan's Yarmuk River. Israel quickly intervened and the diversion was stopped.

More recently the issue of the availability of water has arisen again. A former water Commissioner and Director General of Israel's Ministry of Agriculture argues that political leaders are avoiding the problem that the available sweet water between the Jordan River and the Mediterranean will not meet the needs of the inhabitants of the area.

In fact the problem has begun to be aired internationally. One entrepreneur offers to bring in potable water from Turkey in giant plastic bags towed underwater to Israel.

While the development of long term solutions, including desalination, are being examined, some immediate alleviation of the water supply problem is urgently needed.

There is enough drinking water in the Middle East but as the Arab world increasingly grows a greater percentage of its food requirements, the amount of drinking water is decreasing. Unlike its Arab neighbors, Israel has made a point of using its irrigated lands as productively and effectively as possible. As a result Israel's systems of intensive agriculture has minimized water-waste and the accumulated expertise in water management has been exported to many countries.

The commonly shared problem of a limited water supply for the nations of the Middle East is surely another reason for seeking political solutions to the unrest in the area..

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In this Issue

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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

3rd High-Tech Conference

On July 11th, the Israel High-Tech Report acted as co-sponsor, for the third time, of the High Technology Conference. The other sponsor was the U.S. Information Service. One of the keynote speakers was U.S. Ambassador to Israel, William Brown, who stressed the opportunities opening up in the United States for Israeli science-based industries. He cited a U.S. Commerce report which focussed on 12 emerging technologies with an estimated total market value of $1 trillion.

Minister of Science and Technology, Prof. Yuval Ne'eman, mentioned the challenges for science-based industries with the advent in 1990 of 20,000 professional immigrants, some of whom are very highly qualified. As a result of declassification of information in Russia these immigrants may be bringing with them technological experience on which new businesses might be built.

In last month's Report, Xsirius Superconductivity Limited, was described in detail as Israel's first superconductivity start-up. Dr. Michael Schwartz, Senior Staff Scientist at Xsirius delivered a presentation on " A Material Chemist's Viewpoint of High Temperature Superconductivity", and included an exhibition of the qualities of superconductivity materials. Advance word of the presentation attracted some leading managers of major research and development programs, including Mr. Boaz Lapidot, Vice President in charge of a $430 million R&D program at Israel Aircraft Industries. Conference attendees stated that it could take them one year to evaluate the usefulness of the Xsirius produced multi-layered superconductive magnesium oxide wafers.

A futuristic presentation of the trends telecommunications will take was made by David Rubiner, Executive Vice-President and General Manager of the Communications Department of ECI Telecommunications.

The question of benefits from sponsoring industrial R & D was analysed by satellite in Washington by Dr. Jordan Baruch who cited studies indicating that Government returnsfrom n R & D development investment were greater than benefits accruedby industrial companies from the same activities.

Dr. E.I. Malovsky added that the public returns on government backed R & D was $3 for each $1 invested.

Eli Hurvitz, Managing Director and Chief Executive Director of Teva Pharmaceutical Industries, is now seeking strategies on how the skills of the large pool of professional medical immigrants can be applied to Teva's rapidly growing international business. Last year Teva exported $100 million to the USA and Eli Hurwitz suggested that the figure will continue to rise sharply over the foreseeable future. He noted also that Israel's R & D workforce of about 10,000 had already doubled.

At the Washington end of the satellite program Martin Prochnik, Director of the Office of Cooperative Science and Technology Programs, Department of State, concurred with Dr. Baruch that the human, resource represented by the new immigrants to Israel, was too large for the country's existing finances. He warned that more weight should be given to market orientated solutions and expectations for government support should be lowered.

Conference Program

As part of the conference a 60 minute Worldnet satellite discussion, arranged by the U.S. Information Service, took place. Below is the list of participants and extracts of the discussions which may be of particular interest to you.

Participants in Washington DC:

[JB] Jordan Baruch, former Assistant Secretary of Commerce Science and Technology, now head of his own consulting firm.

[MP] Martin Prochnik, Director of the Office of Cooperative Science and Technology Programs.

Participants in Tel Aviv:

[EM] Dr. Edward Mlavsky; General Manager of BIRD (Binational Industrial Research and Development) Foundation

[EH] Eli Hurwitz, Chief Executive Officer of Teva Pharmaceutical Industries Ltd.

[DF] Dov Frohman, Managing Director of Intel (Israel) Ltd.

[E-IHTR]. Editor of Israel High-Tech Report

On How to Integrate the Recently Arrived Russian Immigrants

DF: One way is to pool the resources of (Israel's) existing industrial parks. Provide overall direction and sponsorship and not just administrative support. Give guidance to entrepreneurs and direct them to sources of money and thus absorb entrepreneurial immigrants.
JB: Study SCUBA, the Science City in Japan and evaluate the problems which resulted in establishing

JB: Study SCUBA, the Science City in Japan and evaluate the problems which resulted in establishing and creating the science city.

A university centered effort is required as well as a new mindset to create a potential for the entrepreneurs to get wealthy. The Route 128 entrepreneurs were driven by the desire to do well and they did well. An artificial atmosphere will not accelerate the integration processes which means a place and atmosphere to become wealthy must be provided.

EH: One model is Ormat, an industrial company in whose courtyard scientists were placed. They were given a canteen where they could have light snacks. a telephone and a secretary were shared among them and a little money was invested. At least two successful ventures came out of this. It is a good idea for Teva, which is active in related products but not diagnostics or equipment, though it does have the experience to understand the value of a specific product idea.

JB: Ormat is a great model since it brought scientists together. The idea is excellent for Teva not because you have technology but because you have experience with users. You can provide an ideal shelter for entrepreneurs who want to get involved in pharmaceutical industries.

E-IHTR: With the experience in hand of new immigrants showing entrepreneurial behavior and after inventorizing and categorizing them, what do you do with them? Should government be approached, should marketing of their skills begin or should there be another approach?

MP: Since governmental resources are sparse and there is a lot of competition for these resources one should go to the market. The potential is there but it has to be properly advertised. Never underestimate the value of the media mechanism. It may make the difference between failure and success. It is important to use R&D funds efficiently. The role of government is to encourage but government subsidies will be scarce in both countries.

JB: Governments are structured to spend money not to invest it. Governments' statements of account in most countries have no asset column. Anything which resembles an investment is listed as an expenditure and that is why it is so hard to get across to Government the need to support the kind of activities which you are talking about. It seems to me a different route is required. In the long term you may be able to educate governments but I would not wait for that. You will have to make contacts through the private sector so that the entrepreneurs, in whatever structure you put them as they spinoff, offer a reasonable return and good assurances.

Long Term View

JB: Cooperative efforts with Japan and the EC countries should be encouraged because they take a longer view than the Americans. Encouragement of R&D in industrial situations by governments is a good idea. BIRD, since it has achieved such enormous commercial success, has returned enormous amounts of money to both Treasuries in the form of taxes on profits from sales.

MP: BARD has penetrated through 450 projects which have resulted in $500 million worth of research results, It is one of the most useful things that the US has undertaken. Only one result is that we have learned about dry land agriculture as well as the Israelis.

E-IHTR: When Government grants (R&D) are pai to companies and result in products which are sold successfully and may result in technological transfer to other nations, should the Government get a capita return as part of the transfer of technology sale?

JB:The Government sponsors an academic activity like research because the public return from research is approximately two-and-a-half times the return to private enterprise from industrial R&D. The overall benefits to society of price reduction through taxes is called in economic terms, an externality. Somebody who does not pay for the research is getting the benefit. To accelerate that kind of benefit to society Government should be encouraged to invest in R&D

EH: Israel has the highest rate of doctors per capita. 2.9 doctors per one thousand population. With the current influx of immigration it will increas to 4.9 per 1,000 inhabitants. The second country in the world has 2.6 doctors per 1,000 population. How do you employ such a skilled labor force and how do you finance it?

JB: BIRD, BARD BSF and Teva should work together to utilize this natural resource. You have a chance to do it differently from any country on earth

MP: The question of the scientists and engineers who have come and will come over the next year or so, obviously poses a major challenge to the Government. Some 20% of the Soviet immigrants are scientists and engineers. This represents a major opportunity. It should not be seen as a challenge, which would degrade the country's economic situation, but rather as a major economic opportunity which will leapfrog the high tech manufacturing

Israeli Companies on Wall Street

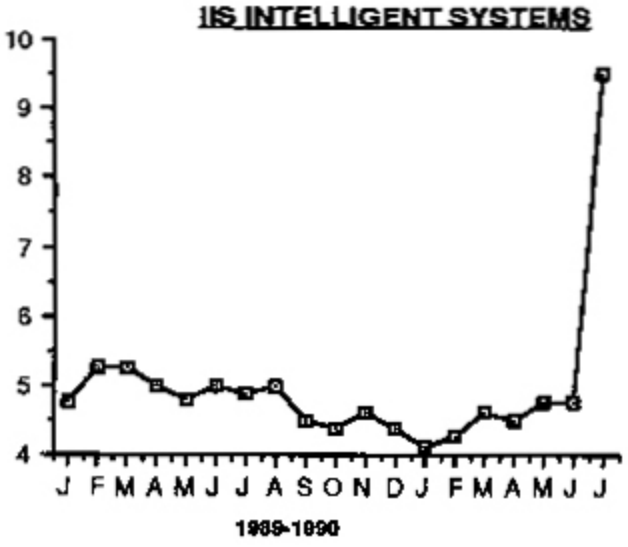
Selected income and earnings summaries for the 3 months ended March 30, 1990, unless otherwise indicated. Nearly all of these companies are intensively export orientated. Prices are as of June 19, 1990 and the price changes relate to those a month ago.

Company	Revs (in$ mil.)	Net Income (in $thou.)	Price	Net Change
ELBIT COMPUTERS Defense electronics ELBTF OTC	84,972	5,068	12.75	+0.375
ECI TELECOM Telecommunications ECILF OTC	17,253	3,591	30.75	+5.0
ELSCINT Medical imaging ELT NYSE	35,583	2,339	3.375	+.125
FIBRONICS Fiberoptics FBRX OTC	14,677	848	11.875	+.75
INTERPHARM LAB. Biological products IPLLF OTC	4,700	(400)	5.625	+0.625
LASER INDUSTRIES Surgical lasers LAS ASE	7,528	(1,018)	5.625	-0.50
OPTROTECH Electro-optical systems OPTKF OTC	20,239	867	7.875	-0.875
SCITEX LTD. Computer graphics SCIXF OTC	70,005	14,149	40.50	+5.0
IIS INTELL. Computer peripherals IISLF OTC	N.A.	N.A.	10.125	+2.375
TEVA PHARMACEUT. Pharmaceuticals TEVYF OTC	70,476	4,925	13.375	+2.25
ELRON ELECTRON. ELRNF OTC	85,702	1,207	7.875	+1.0

research and in the longer or even medium term bring the country to new levels of economic prosperity.

IIS Capitalization Doubles

You may have noticed that the price of IIS Intelligent Systems Ltd. shares has appreciated considerably since the end of May and is now just under $10.



IIS is a relatively small company but continues to maintain profitability in spite of a highly competitive local market. Overseas customers continue to buy IIS terminals and printers. U.S. Bell Helicopter recently received a shipment of 2,500 IIS units as part of a $500,000 shipment. You can look back to IHTR November 1988 where it was pointed out that, "IIS' public offering consisted of only 900,000 shares with the balance being tightly held by the company's four founders". In the first quarter of 1990 IIS reported sales of $4.8 million and a healthy net of $1.75 million. IIS while not a high-tech company nevertheless has caught the eye of local institutional and mutual fund investors who have established what appears to be longer-term positions. The recent share price has not been followed by price retreats that would indicate serious profit taking. However, the relatively small number of shares outstanding is a source of concern and could lead to some price volatility.

Chip Express

You can hear the noise all the way from Santa Clara , CA, where Chip Express announced the opening of its headquarters and the first service center. Chip Express is an Elron Electronics Ltd. subsidiary. Its technology is patented and by its application Chip Express produces low-cost, high performance, gate array prototypes. The quick turnaround time is impressive and the quality meets the needs of integrated circuit users.

Venture Capital Infusion for Rosh

Phillip's Capital Fund and Schroeder Venture Capital have invested $4 million in Rosh Intelligent Systems Inc. Rosh specializes in making field repairs with computer-aided systems. Rosh, along with its fully-owned Israeli subsidiary, provide productivity tools for on-sight servicing of computer and electronic systems.

Two years ago Rosh's Computer Aided Intelligent Service System (CAIS) was heralded as "the first commercially available expert system aimed at solving field service problems". Investors include Tokovsky & Associates, Fred Adler and Elron Electronic Industries.

Zim Prepares for Public Financing

ZIM-Israel Navigation and the State of Israel have decided to sell together 20% of Zim's share capital in a public offering in the U.S. Of the total amount of shares on offer the Israel Corporation will be selling 15% and the State of Israel 5%. An Israel Corporation executive disclosed that the proceeds of IC's sale will be invested in Zim.

Solomon Brothers and Kidder Peabody have been retained as underwriters. The Israel Corporation owns 50% of Zim, the State of Israel 40% and Hevrat Haovdim 10%.

Israel High-Tech Report Index*

155.2 +13.7%

*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

ASE- Conference Planned

You will have a chance to hear about Israel's economy and its publicly trading companies at a Conference jointly sponsored by the American Stock Exchange and Operation Independence. It is to take place during the latter part of November in New York City.

Min. of Health Approval for Laser

Biophoton-3 and infrared therapeutic laser is attracting attention in Israel. Since the local Ministry of Health's approval of the unit as a safe Class III device more than 60 units have been sold. Among the buyers is Haifa's Rambam Medical Center and a geriatric hospital. Users include physicians, dentists and .physiotherapists.

David Blach Appoints Haim Aviv

Prof. Haim Aviv who, in the early 1980's, co-founded Biotechnology General, has announced that he is representing David Blach, an American venture capitalist. Mr Blach, though only in his thirties, has successfully invested in American biotechnology companies at various stages of their development. In the last 18 months he has executed his first investments in Israeli and Israeli-related companies. One of these was Biotechnology General, with an investment of under $5 million. Another was Pharmus with about $1 million. The latter company is active in the development of medicines utilizing innovative drug delivery systems.

From the Lab to the Market Place

Over the years Yeda R&D Co. has been instrumental in forming relationships and marketing Weitzmann Institute's know-how both to Israeli and international companies. Yeda does concede that its activities are made possible by "the quandry that scientists who are engaged in basic research have, regarding how to progress from the basic research stage to one where it is possible to evaluate the economic potential of projects".

One of the main limitations, Yeda points out, is the lack of funds required to advance such projects. This may result in the abandonment of promising ideas or, in some instances, transfer to commercial entities at a very early phase and at unrealistic prices, without first exploiting their potential.

You may expect Yeda to be seeking an investor or investment group specializing in investments in scientific inventions and research projects with an applicable potential, up to the stage where they can be commercialized with high valuation. The company would have autonomy in the evaluation and selection of projects, regardless of whether they originate from the Weizmann Institute or other Israeli institutes of higher learning. The new venture is to establish its own center for pre- industrial technology development. An external investment of $5 million is envisioned.

The Professionals

The Central Bureau of Statistics Report indicated that in 1989, of the 49,000 trained professionals who represented 18% of all employed in industry, 19,000 are engineers and scientists and another 7,200 are economists, accountants, lawyers and the like. An additional 23,000 are engineering assistants and technicians.

Forbes: Fibronics and ECI Telecom

In Forbes July 23rd, 1990 issue, Michael Gianturco, President of the Princeton Portfolios, presented an analysis of the recent rally on Wall Street and of the interest in science and technology stocks. His computerized analysis focussed on the 20 stocks, with the highest ranking according to their relative strengths and terms of relative-P/E values. The number one leader is Fibronics International with a relative strength of 171% and a relative P/E of 47.00 %. ECI Telecon, was third, with 167% relative strength and a relative P/E of 59.00%.

4 1/2 Times Book Value

Oshap Technologies Limited, active in software and high technology businesses, specializes in advanced engineering software and flexible machining systems for international industrial companies, and for the automotive and aerospace industries. Of the 2.34 million public float of shares, more than half are owned by insiders and institutions. As of March 31st, Oshap's book value per share was $1.40.

Ted Turner and Cable TV

Cable TV Station approvals are being issue rapidly

by the Ministry of Communication. Reports state that already more than 40,000 subscribers have signed up to the 15 broadcast areas. CNN Network President and Founder, Ted Turner, recently visited Israel concurrently to CNN's beginning of a Network Cable broadcast in this country.

Institute of Innovation and Russians

The Meitar, Israeli Institute of Innovation, founded by a Russian Scientist in the 1970's, is stepping up its activities in seeking investors for innovations which are the fruit of immigrant technologically--orientated entrepreneurs.

Very Funny Fishes: Eels

According to Jewish Religious Law, eels are not kosher, but Dr Samuel Applebaum, Agriculture Unit Head at Ben Gurion University's Blaustein's Institute for Desert Research points out that there is no injunction against raising eels for export. Dr. Applebaum over the past few years has concentrated his research on the use of geothermal brackish water, available in vast quantities under the Negev desert, for raising fish.

According to this researcher, breeding fish in the desert is a good idea. Many varieties of fish thrive in a warm saline environment. To test the practicality of the research, experiments are being carried out at a southern settlement, Kadish Barnea, situated above a geothermal well containing hot brackish water.

The breeding process consists of growing several thousand baby eels with a starting weight of 9 gms each, in plastic covered ponds. In Europe, where there is a large demand for eels, they are sold for as much as $45 per kilo.

Help for Bladder Sufferers

The lack of bladder control is a serious problem since more than 10% of the population of developed countries suffer from it. Particularly affected are the elderly and woman after giving birth.

At the Technion's department of bio-medical engineering the solution is an innovative intro-urethral valve offering relief without having to resort to surgery. The valve is manually adjustable to a predetermined maximum pressure range. When the pressure range is exceeded the valve opens automatically, allowing urine to pass through. Alternatively, the patient can operate the valve by a magnet externally manipulated.

Ofek-2 Ends Mission

The Ofek-2 having orbitted in space for 97 days has returned to the earth's atmosphere and burned out. Produced by Israel Aircraft Industries and launched under the auspices of Israel's Space Agency, it orbited in an elliptic trajectory 120-900 miles above the earth.

It was in space nearly twice the time originally estimated by IAI. Ofek-2's systems have worked well and it can be assumed that a communications dimension has been added to its other systems.

Export Prize to Orbot

Orbot Systems Ltd. is this year's recipient of the Outstanding Exporter Prize. Second place was awarded to ECI Telecom Ltd.

Orbit Advanced Technologies, Efrat, and Biological Industries were among other science-based industries to receive coveted prizes.

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Where is the Smart Money Going?

Are international companies and venture capitalists seeking to tap Israel's human resource and infrastructure potential? Yes, if we are to judge by the continuous flow of corporate business visitors from overseas. Israel's business community is also very much on the move promoting contacts with its counterparts all over the world. Local businessmen however, with the exception of the managers of publicly owned companies that must report meaningful developments, are generally reticent about their company's activities. Given this situation no one is ever greatly surprised that analysis and

trend identification is complicated and difficult. However, certain statistics indicate which technology areas are identified as strengths.

A record of eleven years of project approvals by BIRD, when viewed by categories, indicates that nearly three of every ten project approvals are in the software field. Five ofevery ten are nearly evenly divided among communications equipment, medical products, and semiconductors. Approximately 100 of these projects "have led directly or indirectly to sales totalling about $1.5 billion", according to information received from BIRD.

The figures are compelling and the areas of software, communications and medical equipment are viewed as strengths which can be exploited.

Powering Wheelchairs

A major problem of the disabled is having to live with restricted physical powers in a world designed for those who have function normally. The number of disabled wheelchair users is surprisingly high. In England as many as 300,000 use a wheelchair with nearly a half confined to it.

People who use wheelchairs consider them as an extension of themselves. and as energy savers. The standard wheelchair is manually prpopelled and requires considerable muscle power to operate it. Modern wheelchairs are battery powered and may include a hydraulic system and other attachments. These are generally expensive and cost thousands of dollars.

Working along lines combining human and mechanical energies Propel Partnership, an industrial R&D company specializing in the development of electro-mechanical consumer products developed an electric drive for manual wheelchairs. The late Professor I. Goldenfeld, a Russian immigrant physicist obtained patents for the system.

Kibbutz Tzora, located in Beit Shemesh more than three decades nitially producing bicycles Tzora began in 1976 to manufacture of nickel/chrome plated tubular furniture frames. In 1987 sales peaked at about $8 million. Economic conditions in Israel cut heavily into furniture sales and the farmer entrepreneurs diversified. Physicist Goldenfeld's innovative electric drive became the object of an intensive development program leading to Samson Power Drive, a fifth wheel attachment for manually operated wheelchairs. Samson is easily attachable (IHTR did it) and allows the wheelchair to climb 12 degree gradients, and ascend and descend curbs up to 7 inches heigh. Samson is attachable to most wheelchairs and at a price which is considerably lower than what is currently available on the market.

Benzi Segal, sales and marketing manager of the rehabilitation division at Tzora, estimates that distributors in England, Norway and those in the U.S. and Canada will provide first full year sales of $1.0-$2.0 million.