

# ISRAEL HIGH-TECH & INVESTMENT REPORT

A MONTHLY REPORT COVERING NEWS AND INVESTMENT OPPORTUNITIES

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## 5 7 5 5 Highlights of the Year in Review

To all of our readers we extend our wishes for a Happy and Peaceful New Year.

Reviewing the events, companies and investments we have covered in the past 12 months, we note that aeronautics, electronics (led by computer systems and software), the healthcare sector (including biotechnology, drug delivery to specific site, diagnostics, monitoring, pharmaceuticals medical procedures including angioplasty and open heart surgery, medical procedures as IVF), telecommunications, international scientific and technology cooperation, high-tech companies on Wall Street, companies with venture capital backing, and government support for R&D have captured our attention.

We present projects which, after screening and interviews, are appealing for their technology, offer benefits to the end-user, are aimed at export markets and are valued reasonably. This particularly applies to companies that are privately owned, and whose valuations are in keeping with the extra risk of an unquoted company. Some are publicly owned and traded on an Exchange, but are as yet "unknown" to a large group of investors. We do not believe that we are offering a value added service by pointing at a great company like ECI Telecom. It is more difficult to target companies such as AG Associates, Opal and Tower Semiconductor. Their technologies are not the easiest to understand and evaluate. However, we have done so and those who used our articles as a basis for further evaluation and investment did exceedingly well.

A broker with a well known investment banker in New York called six months ago and asked which high-tech companies we liked because his clients were seeking to invest in "Israeli high-tech." We mentioned a few and described them. One of those which he subsequently promoted to his clients was Gilat Satellite Communications, the stocks of which have more than doubled in the past two years. Our interest in the VSAT technology was responsible for starting coverage about two years ago.

So what is the point? We have worked hard to focus on leading developments and investment opportunities. A newsletter can go much deeper than newspapers or magazines, and is expected to do so.

Some of the projects/systems/companies appearing in this report:

### Diagnostics

Eliscint Ltd.\* has introduced new CT scanners and ultrasound systems. Orgenics and Healthcare Technologies\* have introduced new and more accurate diagnostic tests for AIDS and chlamydia. Mennen Medical has upgraded its cardiac image diagnosing system, which acts as an angioplasty and radiographic tool, using X-rays to provide an immediate, high-quality picture which can be archived.

A unique system developed by Myriad Ultrasound provides a non-invasive method for measuring osteoporosis

### Biotechnology

InterPharm Laboratories\* has researched, developed and is producing the raw material for producing human fibroblast and recombinant beta drugs used in treating cancer and viral diseases. BioTechnology General\* has developed a genetically engineered version of the human growth hormone used to treat retarded growth and dwarfism. It is priced lower than competing products.

Xenograft Technologies is seeking to commercialize monoclonal antibodies in treating hepatitis. Pharmos Inc.\* has developed, clinically tested and is now awaiting approval from the FDA for its anti-eye inflammation drug.

Teva Pharmaceuticals\* is pioneering in the commercialization of Copaxone for treatment of Multiple Sclerosis.

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Still Hopeful, but Less Optimistic-Editor's column

D-Pharm is synthesizing molecules for use in targeting drugs at sick tissues.

### Monitoring

Spegas is selling its unique system for measuring carbon dioxide in the human system. More accurate than other systems, it is used by leading manufactures of medical equipment and is highly effective in examining premature babies by replacing the need for blood tests.

### Treatment

Laser Industries\* is an innovator in providing CO<sub>2</sub> surgical lasers to hospitals. Recent models are targeted for clinical applications.

Optomedics Ltd. has developed a highly effective, inexpensive CO<sub>2</sub> laser which folds into a suitcase and can easily be moved from place to place. This startup has been in the market for less than a year.

### ElectroOptics

The Thumbscan is a unique finger-worn color video camera with its own light source. It helps surgeons examine parts of the body previously accessible only by a finger.

### Hospital Supplies and Rehabilitation

Disposables are made in a range of high-quality, price competitive materials for use in hospital wards and operating theaters.

A wheelchair which can climb sidewalks or stairs.

A system for elevating a wheel chair to the roof of a car.

An electrically powered wheel chair by Wheelcare which can be conveniently folded and stored.

### Computer Software

Aladdin Knowledge Systems,\* the number-two company in its field, offers protection from software piracy -- a major problem for software developers.

\*Public company whose shares are traded in the USA

### Cancer Research and Treatment

A discussion with Professor S. Chaitchik, Director of the Oncology Department Ichilov-Tel Aviv Sourasky Medical Center. Professor Chaitchik, one of Israel's senior cancer specialists, is active in the care of cancer patients, and is an initiator of both basic and applied research.

Cancer continues to be the major killer in Israel, as it is in other industrialized countries. According to statistics, in the 1990s, there were 10,500 newly diagnosed cases in both sexes. Breast cancer accounted for about 32% of all females who contracted cancer. The incidence of breast cancer is quite high in Israel with 1,619 documented cases in

1989, the last year for which complete statistics are available. The figure is increasing in both young and older patients.

"In 1995 it could reach as high as 2,000," says Miri Ziv, Director of the Israel Cancer Institute. The Israel Cancer Association (ICA) is one of the major sources of research support, with an annual grant budget of \$750,000.

The ICA is the body which deals with the dissemination of cancer-related information, facts and data; it also raises funds for its operations, which include the presentation of developments in the field to professionals and the public. The information campaign to assist in the identification breast cancer targets women from the age of 20 and up, with those over 50 being advised to undergo periodic mammograms. The increased detection of breast cancer among post-menopausal women is related to the growing use of mammograph tests, as well as environmental changes. Israel is a country of immigrants, and the incidence of breast cancer has been analyzed on the basis of country of origin. "Among first-generation Yemenite and Moroccan women, breast cancer was not evident. But it became more common in the second generation, similar to the incidence among Japanese women who first contracted breast cancer after leaving Japan for the United States. One possible explanation ties this sudden increase in the cancer rate to dietary excesses and increased consumption of foods containing a high level of animal fat. Other likely causes are exposure to radiation and viruses, which can change the human DNA structure. Approximately 5% of all cases are genetic in origin, with the cancer gene being passed on either by a mother or grandmother," says Professor S. Chaitchik.

Research into the various causes of cancer is the task of many institutes of higher learning, including the Weizmann Institute, the Hebrew University in Jerusalem, Tel-Aviv University, Ben-Gurion University and others. All major hospitals carry out such research, and may be involved in clinical studies.

Tel-Aviv University Professor Ida Kedar of the Department of Human Science collaborates with Professor Chaitchik in basic research. She is synthesizing antigens -- large molecules with structures that stimulate recognition by a T-cell receptor or antibody. By studying the interaction of antigens with cancerous white cells it may become possible to identify breast cancer in its very early stages. Professor Chaitchik points out that "Our work could lead to new capabilities in testing, screening and even the prevention of cancer." At Ichilov-Tel Aviv's Sourasky Medical Center, the joint project has the financial backing of the Office

of the Chief Scientist of the Ministry of Industry and Trade. The researchers recently acquired a CellScan (IHTIR -9/95) system. The CellScan selects and pinpoints individual cells, and can induce changes in these cells with substances such as antigens. CellScan is produced by MediseI, a development-stage public company which has pioneered a diagnostic system for the screening of breast cancer and AIDS. Antigens can be patented, thus offering the possibility of commercial rewards for those who license the know-how emerging from this work.

Professor Chaitchik concedes that in the past three decades little has been done to discover the origin of cancer. Yet there has been a revolution in the identification and treatment of cancer. For example, "adjuvant treatment" using chemicals or anti-hormone injections following surgery has been practiced in Israel for more than two decades with good results.

The Chaitchik-Kedar research could lead to major advances in the early detection of breast cancer, while unlocking secrets in the basic understanding of the origin of the disease. "Other approaches to cancer care, such as vaccines, may begin to be tested as early as next year," suggests Prof. Chaitchik.

#### What is in the future?

The Chaitchik-Kedar team is one of a number of groups using similar approaches. Researchers in Canada and the United States use different techniques but carry out research along roughly similar lines. As the underlying mechanisms of cancer become better understood, there may be further progress using gene therapy or molecular biology. Tests have indicated that the culprit is the BRCA1 gene.

#### Bank Leumi and Daiwa Institute Cooperate

A cooperation agreement was signed last month between Bank Leumi and the Tokyo-based Daiwa Institute of Research -- the first such understanding between an Israeli bank and a leading Japanese financial institution.

The Daiwa Institute of Research is a member of the Daiwa Securities Group, Japan's second-largest and one of the world's leading investment banks.

#### CSK Group of Japan Invests \$4 M in Optibase

CSK Group, the Japanese high-technology conglomerate, has agreed to invest over \$4 million to acquire about 10% of the shares of Optibase Ltd. CSK, with IBM Japan, Mitsubishi and Sega, have formed DML to serve as the investment vehicle. Dr. K. Ohsaki, representing the CSK Group, has joined Optibase's board of directors.

Optibase (see IHTIR) is one of the world's leading digital video companies, making PC-based systems used for digitizing and compressing video and audio signals. Dr. Daniel Isenberg, President of Optibase Ltd., commented: "Optibase is honored by the CSK investment, and views the group as a strategic partner which will help Optibase expand its business in Japan and develop new products suitable for Japanese customers -- many of whom are Japan's leading electronics, telecommunications and multimedia companies. These firms purchased nearly \$1 million worth of our equipment in the past year."

Mr. Igal Cheraminsky, manager of International Sales for Optibase in Israel, said the new investors are looking for new industrial applications. Optibase may thus find new opportunities for itself in the consumer field -- an important strength of the Japanese group.

The CSK group includes Japan's largest software house as well as numerous high-tech and media companies. Optibase's sales in 1994 were \$8.4 M -- more than four times the 1993 figure, and the company expects this rapid growth to continue. Optibase's shareholders include Moti Gura, Dovrat-Shrem, Marathon, IPC (Singapore), Nippon Investment & Finance (Japan) and others.

#### The Human "Ice Cap" can be Effective

Cancer treatment involves the administration of ever-more-potent substances as part of chemotherapy. Unfortunately, while the therapy may be effective, it may also cause unpleasant side effects -- one of the more disturbing of which is the



*Lowering the temperature of the scalp*



loss of hair.

In an effort to prevent such loss, the lowering of scalp temperature was tried in the United States more than a decade ago, and was found wanting. However, Jerusalemite Fred Peches of Amit Technology Science Medicine [IHTIR-7/94] persevered and developed an "ice cap" which applies temperatures of minus 10 degrees centigrade and constricts blood vessels in the scalp, thus preventing the cancer drug from reaching that area. The treatment is applied 30 minutes before and after the completion of treatment, and remains effective for up to an hour.

The company reports that it has delivered 20 units to Israel's major medical centers, and has received orders from Columbia and Mexico.

More than a year ago, tests with the "Ice Cap" began at Assuta Medical Center, at Tel Hashomer Hospital and at Ichilov-Souraski Medical Center in Tel Aviv. Professor S. Chaitchik, Director of the Oncology Department at Ichilov-Souraski, was among the first Israeli cancer specialists to offer the therapy to patients. "In certain types of therapy there is reduced loss of hair," was Professor Chaitchik's conservative reply in an interview with the Israel High-Tech Investment Report. The two units at the cancer ward are in great demand, testifying to the system's usefulness.

#### Medax 85 Outgrows Jerusalem

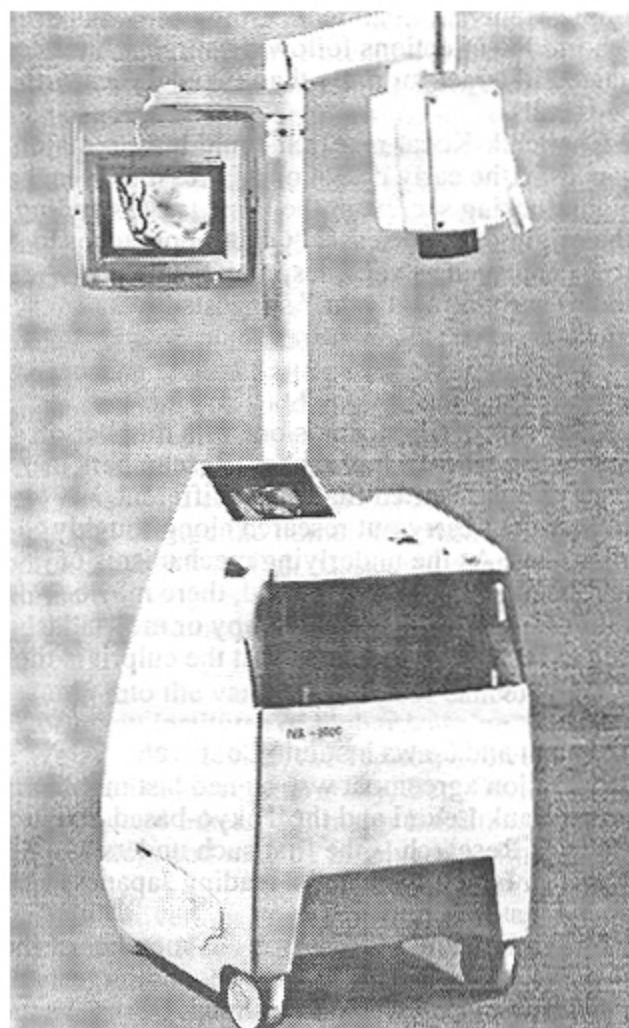
The 10th Medax exhibition of medical technology systems and treatments, reflecting state-of-the-art advancements in medicine, has been moved from Jerusalem to Tel-Aviv's spacious Fair Grounds. The move was necessitated by the large number of exhibitors wishing to participate in this biannual event, which is a part of the Israel Medical Week. Two hundred and twenty Israeli firms participated, together with 800 exhibitors from overseas.

This has become a major international event, with missions arriving from the USA, Australia, South America, China, Taiwan, Ukraine, Russia and Poland, adding color and necessitating simultaneous translation for the lecture-seminars. The Fair's organizers report that the four-day exhibition attracted more than 500 buyers from 32 countries. More than 60 people from the Eastern bank of Jordan alone attended. There were also attendees from Egypt, Saudi Arabia and Yemen.

A buyer from Yemen -- the owner of that country's largest private company specializing in medical equipment -- foresees great potential for medical equipment sales there. Yemen has a population of 12 million, with 2,500 doctors and 50 hospitals. The interest of Jordanian and Palestinian Authority buyers was focused on sterilization equipment, diagnostics and preventive medicine.

#### Military Technology Upgrades By-Pass Surgery

One hundred and nine issues ago, more particularly in the June 1986 issue, IHTIR reported that on May 1986, Rafael -- Israel's armament development authority -- did the unexpected and lifted the veil of secrecy from Israel's foremost weapons system house. As Editor of IHTIR, I was invited to Rafael's sparkling facility in the north of Israel, where I viewed the Python 3 air combat missile, which had been used so effectively in the 1982 War in Lebanon. IHTIR also reported on Rafael's world-class thermal imaging systems, the compact devices for short-, middle- and long-range operations which were integrated into weapon-aiming and surveillance systems.



*Assures the quality of by-pass open heart surgery results*

The systems register and display images by sensing variations in heat and constructing a television picture of the detected object. The systems function at night and under adverse battlefield conditions, penetrating smoke, haze, dust, fog and camouflage nets.

In conversation with Dr. Zeev Bonen, Rafael's Managing Director, I brought up the subject of military spinoffs for civilian applications of the advanced technologies developed by the company. He mentioned a small company in Carmiel whose aim was to develop such applications.

A visit was arranged and my host, Dr. Zvi Meiri, opened the safe, withdrew a box and took out what appeared to be a camera. "This is no ordinary camera," he said. "It is based on technology developed by Rafael, and is being used effectively by the Israel Defense Forces. I believe we should be able to find civilian applications for it in the fields of medicine and civilian security." He flashed the camera and it put an intricate picture of my cheek on a computer terminal. He pointed out that there was nothing wrong with me. By this he meant that the infrared rays had not uncovered any growths or cancerous tumors. I was both relieved and fascinated! Without X-rays, and non-invasively, one could look into any part of the body and obtain a clear picture.

The development of the camera began in earnest only in 1992, when a dedicated team of researchers and engineering developers produced a prototype of the thermal imaging system to assist cardiac surgeons during bypass operations. The result was a unique, advanced imaging system which generates thermal images of the heart's muscles and blood vessels.

Opgal Optronics Industries Ltd., a Rafael subsidiary specializing in night observation systems, has developed a medical system based on this technology. Employing two cameras -- one for video and the other for infrared vision -- the system provides a real-time image of blood flow through the vessels of the heart during bypass operations. Differences in temperature between the arteries and muscles are captured on a thermal camera which produces an image of the arteries in which the blood flow has been renewed. With these images, a surgeon is able to detect blockages or narrowing of arteries and install bypasses. In addition, it indicates the amount of blood in the arteries at the time of the operation. This allows a surgeon to repair continued malfunctions on the spot. The thermal camera also assists in the detection of heart arteries that need to be linked to bypasses, thus aiding the surgeon in this difficult task, particularly in "repeat" operations.

One of the advantages of the system is that it saves time -- which is money for hospitals. This has been proved by the Hadassah Medical Center, which concluded that by being able to see defective blood vessels, a surgeon is likely to increase the number of grafts used, and forestall an early return of the patient for additional surgery.

The results of field tests at St. Luke's hospital in Milwaukee, Wisconsin, USA, confirmed the system's reliability, and highlighted the advantages of the additional vision it affords.

It would appear that Opgal had produced a unique system with many advantages for coronary-artery bypass grafts (CAVG). Aron Wohl, an engineer and marketing product specialist, related that as recently as August 1995, the American Food & Drugs Administration (FDA) had approved the system for marketing in the USA. He pointed out that the system has a number of additional user-friendly features, such as the provision of a total record of patient treatment for reference and as a source of data for clinical research..

Opgal's system (IVA-2000) retails for approximately \$160,000.

As the units become available to cardiac departments in various parts of the world, the company is seeking marketing partners.

In commenting on thermal coronary angiography, the results with 370 patients were published at a conference on Cardio-Vascular Surgery in Leipzig, Germany this year. In the paper it stated: "The cost of commercially available infrared cameras may easily be saved if one or two re-operations for early graft failure are prevented each year. The first infrared camera specially designed for use in CAVG surgery is now available from Opgal Carmiel."

The study concluded that thermal coronary angiography (TCA), involves no interference with the surgical procedure, as TCA outlines grafts and the attached coronaries by temperature alone; without the need for contrast agents. It is an ideal, non-invasive way of immediately documenting the success or failure of myocardial revascularization. Two medical centers in Israel and the USA confirmed the uniqueness of the unit, auguring a promising future for IVA-2000.

#### **Aerotel: A High-Tech Company with a Heart**

After six years of business activity, Israel's Holon-based Aerotel Ltd. is establishing itself as a viable niche player in the cardiac analysis market. It has developed and is marketing a miniaturized ECG which can be easily operated by a heart patient at risk. The patient attaches three terminals to his chest and connects the other end to any telephone. The machine does the rest, recording the heart beat, converting the sounds for transfer over the phone to an external location which produces a ECG easily read by the specialist on duty. In emergencies, precious moments are saved, which could be the difference between life and death. Marketing Manager Amnon Ben Zeev points out that 90% of the production is marketed to the

United States, Europe and the Far East. The local market is not large enough to support the quantities and growth which the company is seeking. Heart patients may subscribe to an emergency and diagnostic center which is equipped with the "Heartline" system. The subscriber receives a pocket-sized Heartline transtelephonic transmitter, and can call the service center at any time of the day and transmit an ECG by simply placing the transmitter on the phone. The personnel at the center analyze the information and provide assistance if needed. Aerotel has established full technological assistance and support for these service centers. A privately held company, it operates in a dynamic, highly expanding and technologically innovative market and continues to penetrate additional areas, suggesting that it intends to position itself strongly in the marketplace.

**Compact TENS Units - for the Relief of Pain**  
TENS (Transcutaneous Electrical Nerve Stimulation), as a technology for reducing bodily pains is in use in some Rehabilitation Departments of this country's Health Service Clinics. In the 1970s then Deputy Prime Minister Yigal Alon, when returning to his home on the shores of the Sea of Galilee, would spend time in the kibbutz factory making the first TENS units to be produced in Israel. These were marketed successfully in the US and other countries.

Years later in 1987, Titan Electronics was formed in Tiberias to research, develop, produce and market devices based on the TENS principle. But Zvi Nachum, the founding engineer, now incorporated a novel method to control the waveform. This innovation is said to be behind the company's claim that its line of TENS products transmits "a current which is felt by the patient in a much softer and more pleasant way, allowing for the application of a much greater current without any feelings of discomfort." The company markets a model which is recommended to relieve menstrual pains. Another model is recommended for muscle toning, and has a slimming effect. Titan has obtained approval for its product from the Israeli Ministry of Health, permitting it to market the devices in Israel. The Ministry is a conservative body, which determines the reliability of drugs and systems before permitting their use by the public.

"The devices are sold in many countries outside Israel, including Australia and Germany, among others," says Mr. Usama Khatib, Titan's Marketing Manager.

**A Better Quality of Life for the Disabled**  
The need to care for and rehabilitate war invalids

has resulted in the development of specialized systems to improve their quality of life. Wheelcare of Benjamina exhibited its Power Chair at Medax. The chair, besides being electrically powered, is hand operated and can be folded into the trunk of a car. The chair retails in Israel for NS 9,000. (approximately \$3,000). However, Marketing Manager Abraham Peled indicates that health care providers in Israel could underwrite as much as 90% of the purchase price.

Wheelcare is a private company which purchased exclusive rights to the design from a kibbutz which was offering the chair as a home assembly kit. Wheelcare then redesigned the 40 kg chair, making it completely foldable while retaining permanent joints.

**Gilat Receives Government Approval for Expansion Program**

The Investment Authority of the Israeli Ministry of Industry and Trade has given approval to Gilat Satellite Technologies for the firm's \$2.2 million expansion program. Gilat is an Approved Enterprise, entitled to favorable tax treatment and other benefits reserved for exporting industries.

**New Executive Aircraft Flies to Royal Reception in Amman**

The brand new IS ST-50, a five-seat pressurized executive business aircraft produced by Isravation in Kiryat Shmona, made its first international flight recently. The ST-50 is constructed almost entirely from composite materials, with the exception of its turbo prop engine from Pratt & Whitney, making it light, easy to fly and highly cost effective. The ST50, piloted by veteran test pilots Danny Shapira and Motty Rader, flew from Kiryat Shmona to Amman, where it received a royal reception. The company's plane was first test flown in May of this year. On one of its early flights it made a forced landing in the fields of a nearby kibbutz, but the prototype was in the air a few days later, and plans for its production in 1996 have not being delayed. The new plane, and another carrying Isravation officials, had been invited to Amman by King Hussein, who had shown interest in the ST50 even before the signing of the peace treaty between the two countries. The aircraft was met by Prince Feisal, and King Hussein, himself an experienced pilot, then arrived to check the new plane. The company currently employs 50 engineers and technicians. In 1996 it plans to open its first assembly-line, initially producing one plane a week. Deliveries are scheduled to begin in August of that year. A mockup exhibited at the Le Borget Air Show in June aroused tremendous interest, and orders have been received since the show ended.



### Jerusalem College of Technology Products find End-Uses

Automobile accidents have increased dramatically in recent years, causing great concern to Israeli citizens. Scientists at JCT have developed a Driver Safety System, an infrared system for identifying the license number of cars whose drivers are speeding or tailgating. The system, mentioned during its development stage in IHTIR, is being adopted for trials in three parts of Israel, and is expected to reduce traffic deaths by 30%. The system developed by JCT will record license plate numbers in all but the most inclement weather. JCT in cooperation with Keren Or, has also developed computer programs for blind children at Keren Or, Israel's foremost institution for multi-handicapped youngsters.

### ADVICE FROM INVESTMENT BANKERS

#### ECI Telecommunications - Revised Up.

The American investment banker, Alex Brown, has revised its rating for ECI Telecommunications from a BUY to a STRONG BUY. What has most impressed the broker is the recently received order for ECI's basic SDH products. The Philippine telephone company's order has led to the creation of 300,000 new lines in Manila, which, suggests Alex Brown, will have an impact on sales and profits for the remaining two quarters. As a result of the revised forecast, the price of ECI shares should be between \$28 and \$30 within six months.

#### Taro Pharmaceuticals - OUTPERFORM

American investment banker Schroder and Wertheim recommends Taro, and projects annual earnings growth of 30% over the next five years. Taro has received approvals from the FDA for six medicinals, and has filed for approval of another 12, which are expected to reach the market in the next two years. The net earnings in 1995 and 1996 have been projected at \$4.2 M and \$5.8 M. In 1994, Taro earned \$3.4 M.

#### Lehman Brothers: "Hold Tase Shares."

The American investment banker Lehman Brothers has advised its clients that they should should "HOLD" their investments in Israeli shares traded on the Tel Aviv Stock Exchange. The next step up, suggests Lehman, will bring the index to 226. or about 8% above recent levels.

#### Healthcare-Organics: Is the Marriage on or is it a Passing Affair?

Much was said in 1994 about the benefits which will accrue to both companies after the merger is consummated -- the papers stating the intent were

signed on April 4, nearly half a year ago. In the meantime, sources close to the situation confirm that some of the larger shareholders at Healthcare are placing obstacles in the way of a corporate marriage.

The delay, however, has not hurt the operating results of either company. HCT is enjoying one of its best six-month periods in recent years. Organics' six-month sales are up by about 20% to \$4.5 million, led by its AIDS and hepatitis diagnostic kits, which accounted for 50% of sales in the first half. Organics has received approval for the AIDS kit to be marketed in the U.S.

Does it make sense that these two companies should fight it out in various markets? For that matter, do both require separate and expensive quarters for production and marketing? The time needed to drive from Yavneh to Ashdod is less than 10 minutes, but the merger seems still much farther away.

#### Eshed Robotec Makes the Red Ink Disappear

Eshed Robotec has been mired in losses for more than a year, caused by the losses of an engineering firm in which it had invested. Now that the damage has been written off, the company's results are beginning to improve. In the second quarter of 1995, Eshed reported profits of NIS 500,000 (\$166,000) as compared to a loss of NIS 1.8 million (\$600,000).

Its sales more than doubled for the period to NIS 20.3 million (\$6.7 million) from NIS 9.4 million (\$3.1 million).

Helping the results was an order for NIS 21 million (\$7.0 million) from Israel's Ministry of Education for its educational robot systems. The company has been successful in providing educational systems, one of which is at Tel Aviv University. It is trying to penetrate the industrial-robot market by forming co-ventures with industrial tool manufacturers. The company's shares on the Tel Aviv Stock Exchange have soared by 21% as investors woke up to the fact that there was an arbitrage gap between Tel Aviv and New York and, after several days of trading, the shares moved to \$1.50. Last year Eshed's shares were traded at about \$0.50.

The company's shares are traded on the Tel Aviv Stock Exchange as well as NASDAQ.

#### Semiconductor Companies Not Viewed as Expensive by Investors

Wall Street thinking is that the smaller high-tech companies are attractive because they show promise of continuous earnings growth. The view is that prices will outpace earnings by 150%. These pundits state that, in spite of sharp advances, the shares are not expensive. Three Israel high-tech

public companies are in the business area of semiconductors.

Opal Inc. produces systems used in semiconductor manufacturing to measure critical dimensions (CD) of integrated circuits (IC). The feedback from the system which is fully automatic, allows the IC manufacturer to maximize and sustain yields at the highest level at which his production line is capable. The company's products have replaced the traditional equipment with electron microscopy, creating a qualitative advantage for users. The conventional optical microscopy was incapable of measuring integrated circuits of less than 0.8 microns, whereas the trend in semiconductor manufacture is for sub-micron integrated circuits. Opal's headquarters are in Santa Barbara and its R&D and manufacturing facilities are in Israel as wholly owned subsidiaries of Opal Technologies Ltd.

The company's sales are conducted through representatives in the US, Taiwan and Korea, and by distributors in Europe and Japan.

Financial information has been available since 1990. In 1992 the company became profitable. Sales rose from \$7.6 million in 1991 to \$24.6 million in 1994. In the first quarter of 1995, sales rose by 60% to \$ 8.3 million from \$5.2 million in the first quarter of 1994. From 1992 the annual profits rose from \$ 7,000 to \$4.1 million in 1994 and \$1.6 million in the first quarter of 1995. The company stated that in 1992, 1993 and 1994 it had achieved 3%, 12% and 18%, respectively, of the world market.

Customers who have bought more than one system include: Advanced Micro Devices, Atmel, IBM, Macronix, Micron, Moses Vitele, Motorola, National Semiconductors, Thomson, Siemens and Texas Instruments.

Opal sold two million shares at \$11 per share in May; it recently traded above the \$20 level. The issue is traded on NASDAQ with the symbol OPAL.

AG Associates was priced at \$11 and began trading on May 16. It recently traded above \$30. It designs, manufactures and markets advanced single-wafer, rapid thermal processing equipment used in the manufacture of integrated circuits. The company's products use high-intensity light to precisely heat a single silicon wafer, which results in the chemical process required to produce an integrated circuit. In terms of sales and earnings, AG Associates is a leader in its field. It introduced the production of wafers by rapid thermal processing ("RTP"), which eliminates the traditional use of batch furnaces. The company is developing additional applications for its process in wafer production. The thermal processing market grew by 25% in 1994, but AG

Associates' sales increased by 36%.

But things were not always so rosy. At first sales grew slowly, and the company had losses of \$7.2 million in 1992 and \$9.5 million 1993 (when its sales were \$23 million). In 1994, sales rose to \$40.2 million on earnings of \$3.2 million. In the six-month period ending March 31, 1995, sales were \$26.2 million, with profits of \$3.2 million. In the quarter ending June 30, sales rose sharply to \$16.8 million, as compared with \$10.3 million a year earlier. Profits climbed to \$3.7 million from \$400,000 in 1994.

AG Associates appears to have made a strong entry into the wafer manufacturing industry, and is positioning itself for a new technology entry (CVD). Its shares are traded on NASDAQ under the symbol AGAI.

For the second consecutive year, Tower Semiconductor Ltd. (NASDAQ: TSEMF) the Migdal Haemek manufacturer of silicon chips, has announced a distribution of 10% of its before-tax profits to its employees. This will total about \$1 million. The company has also initiated a distribution of 260,000 options. In 1994, Tower's net profits rose by 108% and totaled \$7.8 million. As it specializes in the manufacture of semiconductor integrated circuits, Tower is well positioned to continue its strong results. It began business in 1993, and in the fourth quarter of 1994 completed its IPO at \$13 million. It is traded on NASDAQ under the symbol TSEMF. Recently its price rose above \$32. This spring it obtained a new three-year contract to supply National SemiConductors. To meet the growing demand for its products, National SemiConductor will pay a \$29 million advance against this order, payable over the next 12 months, to defray the cost of expansion. This summer, Tower issued three million ordinary shares to the public at \$29. Dr. Rafi Levin and Dr. Yoav Nissim Cohen, two senior officers of Tower, were appointed co-chief executive officers.

#### **Interpharm Unveils Its New Production Line**

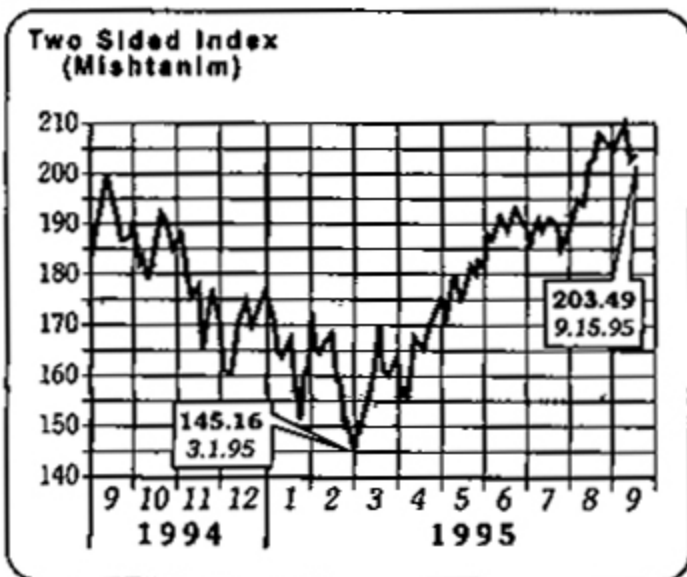
A new production line for the genetic engineering of recombinant interferon was inaugurated recently at InterPharm Laboratories. The company plans to produce a new drug for use against Multiple Sclerosis. Schering has already received FDA approval, and Biogen is awaiting approval. InterPharm is owned by Ares Serono. The basic research for the company's products originated at the Weizmann Institute. In turn, InterPharm scaled up the production and created an effective medicine.

#### **Agis Industries Profits Soar**

Agis Industries is Israel's second-largest pharmaceutical concern, after Teva



Pharmaceuticals. The company, with shares traded on the Tel Aviv Stock Exchange, has bought into an American firm, and expects to increase its export sales.



*The target is 235.0 before the end of the year*

Its second-quarter sales rose by 45% to \$39 million. Profits jumped by 127% to \$6 million, in contrast to \$3.6 a year earlier. But more than half of the profits were traceable to financial activities, and did not come from operations. The company recorded capital gains when it liquidated an investment in Teva Pharmaceutical shares.

#### Comverse and Pacific Bell Sign \$9 Million Contract

Comverse has signed a \$9 million order for hardware and software with Pacific Bell, owned by Pacific Telsys, to provide the American communications firm with electronic mailboxes for more than a million individuals. Delivery is for a maximum 30 months.

#### Pharmos Shares Rise on Heavy Trading

In the middle of March of this year, the shares of Pharmos, (PARS:NASDAQ) were trading at \$0.50. In IHTIR 2/95 -- in a full page update of Pharmos while its shares were still trading under \$1 -- our story carried the following sentence: "At this stage, investment in Pharmos shares is warranted on the part of speculatively oriented investors." At the beginning of the second week of September, heavy demand for the shares pushed up the price to over \$3.0 nearly a 500% rise from its spring lows. Trading activity was as high as 1.76 million shares a session. The company, while continuing to develop its pharmaceuticals, is awaiting FDA approval for its eye drug Lotemax. It is expected that approval will be given by early 1996. If granted, then Pharmos will only be the fourth company in Israel

to develop a drug and bring it through the approval process.

#### New Hope for Diabetics

The Weizmann Institute has discovered a particular protein region which seems to play a key role in a cell's response to insulin, the loss of which response is one of the causes of diabetes.

Insulin is a hormone formed in the pancreas and released into the blood stream to promote the uptake of glucose. Diabetes is caused by either insufficient insulin production or a lack of a proper response to the insulin on the part of target tissues. The new study has pinpointed a region in the target cells that is necessary for a normal response to insulin. Cells sense the presence of insulin via specialized receptors that protrude through their membranes and initiate biochemical changes. The Weizmann team, headed by Prof. Yehiel Zick of the Dept. of Chemical Immunology, deleted a region of the cell protein IRS-1, which is a biochemical link in the insulin-signaling pathways, and found that insulin signaling was disrupted. The researchers concluded that this region -- called the plackstrin homology domain -- plays an important role in insulin action, a conclusion supported by similar findings at the Harvard Medical School U.S. National Institute of Health. This new approach -- attacking the problem from the "inside" by clarifying the steps involved in the transfer of insulin signals, rather than by injecting insulin from the "outside" -- is being adopted by several major research labs around the world.

The plackstrin homology domain contains about 120 amino acids grouped into six main blocks. The Weizmann team removed four of these blocks and found that this prevented the protein IRS-1 from taking on phosphates and binding to other intracellular proteins -- both key steps in insulin signaling. "Now," says Prof. Zick, "we can set a long-term goal of enhancing its binding capacity as a possible method of helping diabetes patients. Many obstacles still remain, however. Various elements involved in insulin signal transfer must be correctly identified, and whatever drugs are given must be specific. We do not wish to cure one disease while exacerbating another. We must also find an effective way to deliver these drugs through the plasma membrane and into the cell. Presently we are at stage 1 -- defining the players in the game."

#### FDA has not yet Approved Copaxone®

At the end of August, Teva Pharmaceutical Industries Ltd. (NASDAQ: TEVY) announced that the US FDA had refused to approve for filing its New Drug Application for Copaxone®, the

company's innovative treatment for multiple sclerosis (see IHTIR August 1995). The grounds for refusal related solely to gaps in the chemistry, manufacturing and control section of the New Devices Application (NDA) relating to the preparation of certain reference standards and markers. According to FDA regulations, once a new drug application is submitted to the FDA, the FDA has 60 days in which to determine whether or not the application is sufficiently complete to be filed. If the FDA believes the application is not complete, it issues a "refuse-to-file" letter to the sponsor. Teva immediately furnished additional data and firmly believes that the information required by the FDA should not have resulted in a refusal to file. Mr. William Fletcher, President of Teva, expressed his surprise at the content and timing of the letter, as the details requested were more appropriate to the pre-approval inspection phase of the NDA review process.

"We are confident that we will be able to furnish the FDA promptly with whatever additional information it may require, and believe we will be able to get our filing back on track in the very near future," he said. The FDA has indicated it will grant Teva's request for an early meeting to expedite the resolution of the outstanding issues.

In spite of statements from the company that the issue was minor, one of the leading Israeli newspapers published two articles suggesting that the application could be problematic. After a few days of nervous selling, a buying sentiment began to push the price of Teva shares back up towards the \$38 level.

#### Still Hopeful, but Less Optimistic

On September 25 we celebrated the start of the new Jewish year, 5756. The year 5755 was an eventful one, and lively in many respects. The economy has been moving strongly ahead. Exports, powered by high-tech sales (notwithstanding the prior problems of a weak dollar), have increased, and companies are reporting highly profitable second-quarter results. New markets have been opened in Eastern Europe, India and China in response to expectation of peace in this region. The standard of living is also on the rise, with a Gross National Product last year of \$15,000 per capita. Economists are looking for sustained growth in the economy and in the level of prosperity, while hoping to restrain inflation and control the growing deficit in the balance of payments. Even with a 1.2% advance in the CPI for August, the index has advanced less than 4.5% since the beginning of 1995.

Efforts at peace making, rooted in the Oslo Agreements of two years ago, are continuing, but at a high price in terms of human life. Suicide

bombings have been carried out in Tel Aviv, Ramat Gan and Jerusalem. Nonetheless, there is still less violence in Israel than in most other countries, according to the Economist. The worry is that, if terrorism continues to be permitted, and even encouraged by the Arabs, there could be more incidents of retaliation by those Israelis who feel that the government is not doing enough to protect them. Unemployment and civil disruptions are preventing the nations of the world from giving more than token economic and political support to the new Palestinian entity in Gaza and Jericho. The issue is further complicated by the Palestinian Authority's fragile and largely inept and possibly corrupt economic structure. Mr. Arafat has been criticized for not responding to the needs of his people, who are clamoring for jobs and an improved standard of living. The time elapsed between the signing of agreements and the reaping of economic dividends is too long and unbearable to the Palestinians.

Israeli negotiators are attempting to work out agreements for the turning over of basic services including that of water supply. Some of these issues are sensitive. Control of the area's scarce water supply is a particularly thorny issue, since the Palestinians are demanding the same amount of water per capita that Israelis are using. The Palestinians are being encouraged to prepare for free elections as they move down the road towards democratic self-rule, but Hamas, the National Front for the Liberation of Palestine and other extreme nationalist groups oppose what they see as a betrayal of the Palestinian dream of regaining all of Israel, and attempt to disrupt the peace process. The government of Prime Minister Yitzhak Rabin is urging a speedier resolution of outstanding issues and Yasser Arafat is trying to hasten the transfer of autonomy. Some of the key outstanding issues touch on the basic concepts of peace. For Israelis, the key issue is security. The need for security is deep-seated, with roots in the Holocaust and in nearly five decades of subsequent strife. More suspicion is being aroused by Arafat and his inner circle, who speak of peace when addressing Western audiences, while preaching to Arab audiences of jihad, or holy war, against Israel. Tapes of such rabid diatribes by the Palestinian Chairman, presented on local TV, have had a shocking effect.

Should mutual trust deteriorate further, it could prove to be an overriding obstacle to further progress in peace negotiations. In short, we are still hopeful, but less optimistic than we were a year ago. A peace relying on Israel's inherent strength is a possibility, but peace built on a growing feeling of mutual trust is the real goal.