# el high-tech repo

JOSEPH MORGENSTERN, EDITOR

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# · From the Editor's Desk --

# in the Beginning

Nearly a quarter of a century ago, Russia severed connections with Israel. Israel now perceives an opportunity to renew ties. Businessmen traveling to Russia found counterparts with whom they negotiated projects and sought trade opportunities. Deals were struck.

Is "little" Israel trying to get into the unified Europe of 1992 through the Russian back door? Is Eastern Europe seeking to extend its American ties by way of Israel? Perhaps, but even more significant than the trade prospects are the 150,000 Russians who have arrived in Israel over the past 12 months. America has declared that it is dropping trade restrictions with Russia as a result of this new "open-door" policy. With such major rewards being offered the Russian government, it's likely that the flow of Russians to Israel will increase even further in 1991.

Who are the Russian newcomers? An extraordinary number are what Israelis call "akademaim" - people with degrees from institutes of higher learning, such as physicists, engineers, computer specialists and doctors. In fact, the brain drain from Russia will more than double the number of such specialists in Israel, Eli Hurvitz, Teva Pharmaceutical's CEO and chairman of the Weizmann Institute's executive council, recently stated that "the high quality of immigrants reaching Israel makes it possible to significantly increase output per worker, and close the gap in Israel's balance of payments."

Weizmann Institute President Prof, Haim Harari, at the meeting of its Board of Governors, stated that "spheres upon which new emphasis is being placed include brain research, environmental studies, submicron research and science education. In addition, the institute is playing its part in the absorption of Soviet immigrants, 40 of whom have already been taken on as scientists and students."

Making proper use of this goldmine of human resources could make Israeli science and technology already world class - world dominant, and represents one of the great challenges of our age.

This issue of IHTR, and those that follow, will document the innovative approaches being adopted to create new jobs for the recent arrivals.

Russian-Israeli Scientific Ties - Fact & Fiction How much smoke and how much fire is there in the rumors of scientific cooperation between Russia and Israel? According to Prof. Rem Petrov, vice president of the National Academy of Sciences in the USSR, there are many areas of mutual interest. He suggests that a committee of five scientists from each

country explore the possibilities.

What can the scientists of a "small" country like Israel offer the USSR, IHTR asked Prof. Petrov.

Showing some annoyance, he pointed out that size is irrelevant; scientific brilliance is what counts. He conceded that massive projects such as "big machines" require many people and large budgets, but argued that where creative brains are more important than economic brawn, Israeli contributions can be formidable indeed.

The Israeli-Russian committee of 10 will probably concentrate on biotechnology, molecular biology and immunology. Another area which could benefit the world would be based on Israel's already broad experience in the reclamation of desert soil.

# —In this Issue—

Editorial Comment: In the Beginning: Russian-

Scientific Ties...Fact or Fiction

Recent Developments: Bitter Rivals to Merge ICOWS-Israeli Companies On Wall Street: earnings

generally positive

Statistical Table Third Quarter Report are all in IHTR Index hovers at pre-Gulf Crisis levels News from institutes of Higher Learning: speeding cactus growth: reaching for Mars in 2015 The new Russians bridge university and industry while others market their skills

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# RECENT DEVELOPMENTS

# Bitter Rivals: Optrotech and Orbot to Merge

The spectacle of two Israeli companies fighting over the world's estimated \$175 million market for equipment for the printed circuit industry will soon be over when the proposed merger is effected. Between them Optrotech and Orbot had 80% of the world market share. The announcement of the proposed merger which would form a new company with share capital divided 60/40 between Orbot and Optrotech, immediately drove up the price that company's shares from \$ 5 to \$9.

Oscar Gruss & Son Inc., members of the New York Stock Exchange, analyzed the merger and project a \$13 price for the aftermerged shares. Our own feeling is that at such rates, the shares would be considerably overpriced.

On December 17 Optrotech's market valuation stood at \$43.8 million. Few days earlier the shares jumped upward sharply as the news of the merger plan became public. On November 12 the company's market valuation was \$23.9 million.

#### JOLT

Dr. David Medved has formed JOLT (Jerusalem Optical Link Technologies). The company is located at the R&D Park of the Jerusalem College of Technology (JCT), and is developing high-speed optical transmission systems in association with a distinguished staff of JCT scientists.

Hillel Bar-Lev, co-founder and former managing director of Moked, has been appointed JOLT's chief engineer. JOLT specializes in the development and production of networks for high-speed digital data and high-resolution video transmission, particularly for short range, wide-field-of-view applications. JOLT will further develop air-link systems such as the JDL 600 TV and 800 series.

#### Israel's Answer to Iraqi Gas Attack

The Israeli, American and British armies are considering a revolutionary Israeli breathing device as a treatment for victims of poison gas. Even Iranian and Iraqi companies showed an interest when the instrument was being developed two years ago.

The Hayek Oscillator, named after inventor Dr. Zamir Hayek, stimulates normal breathing without the need to insert a tube through the trachea, which is the principal method in use today. Described by experts as a conceptual breakthrough, it has aroused

wide interest in medical circles, and has received the approval of the U.S. Food and Drug Administration.

# Efforts at Absorbing Scientists & Engineers

The Seventh Meeting on Optical Engineering, co-sponsored by the Israel Laser & Electro-optics Society and the Association of Engineers and Architects, drew over 500 participants to the Tel Aviv Hilton on November 12-14.

At the last meeting, a special session was devoted to the problems of Russian scientists and engineers in Israel. Benny Shapira, Director of Exact Sciences, spoke about the incentives available for immigrant scientists.

The Ministry of Science and Technology then outlined electro-optics and lasers in Israel, with an emphasis on industry. Immigrant scientists working in industry and academia then discussed their experiences in the Israeli economy. As a result of all these efforts, 15 of the 85 immigrants that attended got promising leads for work in Israel.

#### **Business Results**

Elop (Electro-optics Industries) has reported net profits of \$40,000 for the first nine months of 1990. The company suffered a loss of over \$4 million in 1989.

Elop is participating with Tel Aviv University and the Israel Space Agency in the design of a satellite-based ultraviolet telescopic system which can measure ultraviolet radiation emitted by celestial objects. The system will include three telescopes, each fitted with a 20-centimeter mirror, and would receive signals on three different wavelengths.

The telescopes would enable scientists to discover more about such things as the Milky Way, Quasar populations and stars in other galaxies.

Martin Marietta Executives recently visited Israel, and advised Elop that it had earned the outstanding supply award. Elop is developing systems for the American Apache helicopter. Components being supplied include target acquisition, aiming and night-vision systems.

### Imaging Prices Drop

Private hospitals in Israel are reporting a loss of income from diagnostic testing. The revenue from ultrasound has dropped from \$35 per test to about half of that amount. CAT scans are being administered at bargain-basement prices of about \$75-150 per scan, as there are now nine scanners in Tel Aviv alone. Waiting lines for these services have been reduced considerably.

#### NASA Buys Radiometer

Inframetrics, an American subsidiary of Elbit Computers, has sold a Model 600 radiometer to the U.S. National Aeronautics and Space Administration. The instrument will be used to investigate the effects of weightlessness and the formation of crystals in space. Three other radiometers will be incorporated into the space program in 1992.

### Turbines in the Cold

After one of its turbines successfully powered the telecommunications and satellite links of a research station in Antarctica for six years, Ormat Turbines Ltd. will be supplying the U.S. National Science Foundation with two more.

### Optical Engineers Meet

The 8th Meeting of Optical Engineering in Israel will be in December 1992. The gathering will feature new developments in optics and optical engineering, and will pay special attention to optics in medicine, industrial instruments for production and control, microlithography, remote sensing and space optics. Some general issues will be discussed, such as the EEC and Israeli optical industries, environmental problems and the use space-borne optics for monitoring and remote sensing.

# ISRAELI COMPANIES on WALL STREET

# InterPharm Laboratories Valuation Soars

The company's shares advanced sharply on market rumours that ILPF is about to be granted IND approval in the United States to carry out clinical trials for its first recombinant product, Beta Interferon. RBIF has been recently approved for clinicals in the United Kingdom. The shares have more than doubled in price since mid November. (see page 4 statistical table)

# Optrotech is Suffering from Restructuring Program

Devotion to good technology and a growing market share pushed Optrotech's performance to a peak in 1989, when it earned more than \$4.5 million. But competition from its Israeli rival Orbot, combined with a more difficult market, has resulted in falling profits. It is too early to tell whether the bottom has been reached. In mid November the company announced its third-quarter results, but these are inconclusive. On sales of \$20.5 million Optrotech earned \$105,000.

Compared to the same period in 1989, when it earned \$1.3 million on 10 per cent less sales, the results are far from impressive.

Only when Optrotech successfully expands its marketing base in Europe and the Far East, and cuts its local costs, will its technological strength and high R&D spending be reflected in improved earnings.

# Teva Frets About Approvals

As the U.S. market becomes more meaningful to Teva's overall plans, the company is finding itself frustrated by delays in getting American approval for new generic products. Similar delays in Israel caused CEO Eli Hurvitz to focus on these problems in his November report on the third quarter, which ended September 30. Yet the results were in line with most expectations, as Teva reported earnings of \$3.8 million on sales of \$69 million. Teva's statistics are improving, and sales could exceed \$300 million for 1990, with net earnings of more than \$17 million.

#### Growth Continues at Rada

Annual sales could reach \$25 million with profits of \$1.6 million, but a very strong fourth quarter would be needed. After nine months, Rada's sales exceed \$17.7 million, on which it earned \$1.2 million. See table on page 4.

#### ECI Telecom

ECI Telecom has declared a first-time ever interim cash dividend of \$0.22 per share.

#### InterPharm Labs

InterPharm Laboratories, after nine months of 1990, has reported sales of \$16.4 million and profits of \$1.35 million. The third-quarter results reflected sales of \$6.97 million, and net income of \$1.45 million shows a potential for high profitability. The question that everyone is asking is: can InterPharm put together three consecutive quarters of growing sales and high profit margins?

#### Laser Industries Brighter

An extraordinary income of \$991,000 helped Laser Industries register its first profitable quarter in 1990. A year ago, the company had a net loss of \$8.0 million. Sales for the third quarter totalled \$7.8 million, and \$24.1 million for the nine months ending September 30, 1990, compared with \$6.6 million and \$22.0 million respectively a year ago. For the nine-month period, Laser reports a net loss of \$1.1 million, compared with \$11.1 million a year ago.

# Israeli Companies on Wall Street

Selected income and earnings summaries for the quarters as noted, unless otherwise indicated. Nearly all of these companies are intensively export oriented. <u>Prices are as of December 17, 1990</u> and the price changes relate to those a month ago.

Company	Revs (in \$ mil.)	Net Income (in \$ thou.)	Price (in \$ )	Net_ Change
ELBIT COMPUTERS Defense electronics ELBTF OTC	264.16 Q1-Q3	15,880	14.375	-0.375
ECI TELECOM Telecommunications ECILF OTC	54,299 Q1-Q3	11,142	24.500	-1.625
ELSCINT Medical imaging ELT NYSE	114,550 Q1-Q3	8,678	2,375	-0.250
FIBRONICS Fiberoptics FBRX OTC	45,500 Q1-Q3	2.600	7.875	N.C.
INTERPHARM LAB; Biological products IPLLF OTC	16,414 Q1-Q3	1,448	13.500	+7.125
LASER INDUSTRIES Surgical lasers LAS ASE	24,104 Q1-Q3	(1,064).	3.375	-0.375
OPTROTECH Electro-optical systems OPTKF OTC	59,937 Q1-Q3	1,030	8.250	+3.750
SCITEX LTD. Computer graphics SCIXF OTC	210,531 Q1-Q3	51,983	15.625	-0.125
IIS INTELL. Computer peripherals IISLF OTC	23,049 Q1-Q3	4,089	10.125	+0.250
TEVA PHARMACEUT. Pharmaceuticals TEVYF OTC	210,257 Q1-Q3	12,530	12.000	+1.000
ELRON ELECTRON. ELRNF OTC	265,086 Q1-Q3	5,091	7.375	+0.375

## New R & D Funding by BIRD

BIRD, the Israel-U.S. Binational Research and Development Foundation, has committed over \$4 million as its 50% share of 10 new projects.

BIRD's Executive Director, Dr. Ed Mlavsky, announced that project royalties exceeded \$4 million in 1990 - an all-time record.

U.S. companies approved for funding include Applied Materials Inc., Digital Equipment Corporation, IRIS Graphics Inc., Ready Systems Corp., Standard Microsystems Corp., WINGS for Learning Inc., Harris-Adacom Corp., BasicNet Technology Inc., Uro-Care Laboratories Inc., ICN Biomedicals Inc. and Brinkmann Instruments Inc.

Israeli companies receiving approvals include B.A. intelligent Networks, Degem Systems, Maintek, Applied Materials (Israel), Adacom Technologies, Relational Technology System, Ready Systems (Israel), SRD Medical, Galai Laboratories, Savyon Diagnostics and Scitex Corp.

To date, BIRD has invested over \$70 million in projects which have led to about \$1 billion in exports from Israel, and about another billion in value added in the U.S. BIRD's annual income of \$12-13 million comes from interest on an endowment of \$110 million provided by the two governments, and from royalties generated by successful projects.

# NEWS FROM INSTITUTES OF HIGHER LEARNING

The average potted cactus grows only several centimeters annually. This makes fully grown exotic cacti rare and relatively costly. Professor Gutterman of Ben-Gurion University has succeeded in hastening growth. For example, the ball-shaped cactus known as "mother-in-law's chair," which ordinarily takes 25 years to mature, requires only 5-6 years under his care.

He grows the cacti in hothouses, on desert loess soil with added sand and organic matter, a 50% reduction in light intensity and a very strict water regime. His techniques expedite growth while maintaining the natural structure of the roots and body of the plant, thus preventing its collapse, despite the rapid increase in size.

Though cacti flourish in desert soil, and some species have tasty fruits, they have never been considered a commercial crop because they require manual harvesting, and the fruit are inaccessible among the prickly branches. To overcome this problem, Professor Gutterman has developed a

dwarf cactus, opuntia ficus indica, achieving plants of uniform size and with a single fruit-bearing branch which can be harvested by machine. As an added bonus, this cactus has relatively few thorns.

#### BGU

A scientist from Israel's Negev desert recently visited a lake in a remote province of China to advise scientists there on the cultivation of spirulina microalgae for commercial use.

Professor Amos Richmond confirmed that the lake was a suitable site due to the high alkalinity of its water, and recommended that the spirulina be grown as an ingredient in food pellets for fish and lobsters. Two Chinese scientists will visit the Blaustein Institute to study cultivation techniques.

Many species of microalgae, Professor Richmond explains, have a high protein content, and contain minerals and unsaturated fatty acids of high nutritional value, as well as vitamin B complex. They are an ideal crop for countries with abundant year-round sunlight, and can be produced with brackish or salt water. The algal biomass is a replenishable source of food, raw materials and energy.

The Bioalgal Technology Laboratory has conducted joint research on microalgae cultivation with scientists in Thailand, the Philippines, Guatemala and Mexico, with funding from AID-CDR, the cooperative research program of the U.S. Agency for International Development. Another cooperative venture in microalgae cultivation is being conducted with the University of Firenze, Italy.

#### Technion and Mars

A cooperative agreement has been signed between the Technion and the USSR Academy of Sciences. Research will be carried out at the Technion's Space Research Institute and its counterpart at the Institute of the Soviet Academy.

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155.28 + 2.69%

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Technion researchers will be involved in the Mars landing scheduled for 2015, focusing on handling and control of the spacecraft. The research is aimed at utilizing Russian expertise in rocketry, and will include platform design, structure, stabilization and altitude control.

Technion strengths have been identified in fine instrumentation, modern computers and sophisticated experimentation.

#### Sidney Musher Passes

The Sidney Musher Building for Science & Technology was dedicated at the Weizmann Institute on November 14. Mr. Musher, chairman of the PEF - Israel Endowment Funds, was honored for his many years of involvement in a broad range of programs in Israel. Mr. Musher was known to this editor for many years, and it is with sadness that we report his death four days after the dedication.

The building named for him develops curricula, courses, textbooks and teaching aids for Israeli science and mathematics classrooms, and runs teacher training programs for science and mathematics.

#### Science and the Disabled

What do Weizmann Institute scientists do in their spare time? Engineer Daniel Barak of the Scientific Services Department, whose task is to build, adapt and maintain sophisticated instruments for institute scientists, finds solutions for wounded soldiers.

Sometimes Barak and his colleagues, working after hours, adapt already-existing gadgets; in other cases, they develop new ones. For a young man amputated above the elbows, the team built a special handle that keeps a moving spoon in a horizontal position, thereby preventing spilling. Institute personnel also replaced the knob on his typewriter with one that he could grasp with the hook of his prosthesis, thus permitting him to insert paper without difficulty.

In another case they eliminated the need for 24-hour-a-day bedside care for a paralyzed patient, whose push-button switch was replaced by a far more sensitive one, activated by pressure from his palm or chin.

The department is particularly proud of one person it helped, Yekutiel (Kuti) Gershoni. Thanks to the efforts of Weizmann personnel and others -- plus his own unfailing determination -- Gershoni, who lost both hands and was left with severely damaged hearing and sight when a mine exploded, finished high school, earned a doctorate, and now lectures on African affairs at Tel Aviv University. After he had

established himself, Dr. Gershoni turned once again to the Scientific Services Department on behalf of a blind student handicapped by his inability to read maps. The department designed and built a series of plywood maps on which borders between countries are represented by thin string and "borders" between land and sea by thicker string. Nylon thread symbolizes rivers, while seas and oceans are indicated by sand glued to the plywood base.

These maps are now standard equipment in schools where blind youngsters study together with sighted ones.

Barak and his colleagues cannot handle most of the requests they receive, but now, thanks in part to their initiative, a special body (Milbat) has been established at the Tel Hashomer Medical Center to help the handicapped acquire the technical aids they require.

The rehabilitation work of the Scientific Services Department was publicly recognized when it was presented with the Sir Charles Clore Prize for Distinguished Service of Science to Society in 1985. Moreover, Barak has been an invited speaker at several conferences on rehabilitation.

# TAU Experiment Chosen for Israel's First Research Satellite

Tel Aviv University's proposal, preferred over 11 competing proposals, entails the design of a satellite-based ultraviolet telescopic system (described above). The system will be developed at TAU in cooperation with Electro-Optics Industries Ltd. Prototypes are to be finished within three years. The Space Agency is keen to promote astronomical research in Israel, and will be investing several million dollars in this project. The Agency expects to launch the research satellite in 1994.

### USSR Academy of Sciences President Honored

Prof. Guri Ivanovich Marchuk, President of the Russian Academy of Sciences, was awarded an honorary doctorate in philosophy by Tel Aviv University. Prof. Marchuk is one of the Soviet Union's leading experts in computational mathematics. He is a Lenin Prize laureate, and received the Order of Lenin Medal several times, as well as a number of international scientific prizes.

#### Skin-stretching Device Developed at Technion

Researchers at the Technion Institute of Technology have developed a new method for dealing with damaged skin. A device for the stretching of whole skin, which provides extra skin for the closure of surgical wounds and skin defects, has been developed by a Faculty of Medicine team headed by Professor Emeritus Bernard Hirshowitz in cooperation with Professor Ella Lindenbaum.

Because skin adjacent to the wound is stretched to obtain closure, no grafting or skin flap rotation techniques are needed. This eliminates the major surgery required in conventional procedures. Using a patient's own skin also facilitates healing.

The device is based on the discovery that under certain circumstances, and with certain precautions, skin can be stretched significantly while maintaining its inherent qualities.

Over a period of about 20 minutes, the two skin edges are stretched until they meet over the center of the wound, where they can be sutured.

The two "arms" of the device hook along the full length of the skin margins, which are then pulled together over a serrated guide and held in place by a ratchet which permits the arms to move closer to each other until they are in contact.

Advanced models of the device could include an instrument to measure the force exerted on the skin, providing a warning if stretching exceeds permissible limits.

The device can be employed before, during, and after surgery. In certain cases, the surgeon may decide to stretch skin before operating - when it is necessary to remove skin because of infection, for example. Skin may be stretched during surgery before commencing therapy, or several days after surgery, when it is necessary to first ascertain that no infection is present.

In plastic surgery, the device helps achieve more esthetic results.

A U.S. patent has been granted, and the Technion R&D Foundation is seeking commercial partners.

The Technion skin stretcher has been employed at Haifa's Rambam Hospital over the past two years with encouraging results. Design of the device is being carried out by Amnon Levy, Head of Technical Services at Technion's Faculty of Chemistry.

# Russian immigrants can Bridge University and industry

A Hebrew University-based physicist is using university-developed scientific knowledge to accelerate the performance of industrial machines, and is at the same time creating employment for five Russian immigrants - holders of doctorates and experienced in algorithms and data processing.

Professor Sorin Solomon and a team of scientists carry out basic research in computational science, with the support of a \$100,000 grant and DM 1 million worth of Cray supercomputer time. Their work concentrates on computer simulations. The group has developed algorithms which slash the time needed to apply simulations.

Algorithms are sets of rules which specify a sequence of actions to solve a problem, and which then can be carried out by computers. Collaboration was obtained from scientists in Princeton, Hamburg and the Weizmann Institute. With the use of powerful visualization equipment, results may be displayed in the form of mathematical movies to investigate such phenomena as nuclear reactions, evolution or nuclear magnetic resonance.

Impressed by the quality of Russian immigrants, Prof. Solomon put together an appealing package including electronic publishing equipment. Yissum, the Hebrew University Research and Development Company, provided PCs for the development work, and the Office of the Chief Scientist of the Ministry of Industry and Trade has been requested to put up 66% of the Russians' salaries for two years. Scitex, attracted by the prospect of improving its already excellent system, has provided machines for the work. Funds are being sought for the visualization equipment. The Jerusalem Development Authority has donated approximately 200 sq. meters of

# ISRAEL HIGH-TECH REPORT NEWS AND INVESTMENT OPPORTUNITIES

NEWS AND INVESTMENT OPPORTUNITIES

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working space. The Russian scientists are currently getting hands-on knowledge of the systems they will use, improve and develop. The new immigrants are confident that by the end of 1991 the fruits of their work will allow them to become a self-sufficient commercial company offering services to a broad range of industrial clients. In the meantime, Professor Solomon is seeking funds to cover the cost of additional Russian experts who can take part in similar projects with industrial partners.

### PATTA Markets the Russian Immigrants

The Israeli wing of the PATTA Company, founded in 1990 with one branch in Israel and one in the USSR, is manned by seven professionals, while the Leningrad branch employs 100 people and concentrates mainly on industrial/technical development.

The Russian branch also coordinates PATTA's activities in the USSR, including the detection of productive groups of future immigrants and potential projects.

PATTA promotes productive groups by encouraging immigrants who had previously worked together to work on the same basis in Israel. PATTA feels such groups could be used to sell R&D services to foreign and Israeli companies.

PATTA is already involved with about 10 such groups. PATTA also tends to serve as an umbrella company by providing technical assistance such as translation, technical writing, mail, connections, advertising and small investments.

"A lot of brilliant initiatives may only require time, because new immigrants often lack the basic language, understanding of Israeli and Western economies and connections - not to mention money," said a PATTA spokesman.

Examples of projects operated by PATTA include:

- \* a device to measure the intensity of breath. There are applications in sport and for medicine. The device is capable of discriminating between breath and wind. Laboratory prototypes exist.
- \* automated testing of the quality of oil and oil products. The laboratory prototype exists.
- \* a new absorbing material, each gram of which is able to absorb 7 liters of water (while the best Japanese analogs can absorb only 2 liters). This

- material could be used in agriculture, oil refinement.
- \* a new Russian language editor/spell-checker.

  Marketing has already started in the U.S.
- \* a proposal from the Leningrad authorities to open the first kosher restaurant for tourists in Leningrad. There is a suitable spot in the center of the city. Investment is needed.

PATTA is also active in other fields of Aliya:

# Advertising.

PATTA is the exclusive representative of several Soviet Jewish publications. As such, it was the first to advertise an Israeli enterprise - Bank Leumi - in the USSR, in the magazine of Jewish culture (VEK) with a circulation of 50,000. Other Soviet mass media are also at PATTA's disposal.

# **Publishing**

PATTA publishes *Contury*, a new magazine dealing with absorption problems. The magazine is published in the USSR and distributed through the network of umbrella organization of Soviet Jewry, VAAD. *Contury* is supported by the Jewish Agency, the Zionist Forum of Natan Sharansky and others.

The Russian branch of PATTA also supports Jewish cultural activities in Leningrad, such as the Jewish University and The Center for Research on the Pale Settlement.

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