

ISRAEL HIGH-TECH & INVESTMENT REPORT

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Random Thoughts on the War and After

While the spectacular high-tech air strikes were capturing the attention of the observers we heard reports how the new version of the Patriot (PAC3) had hit several incoming low flying missiles sent into the direction of Kuwait. While it may be premature to award the PAC3 the highest grades yet indications are that the improved Patriots scored infinitely better than the earlier versions. Israel's Arrow System the joint Israel-US anti-ballistic deterrent was not put to the test. We had reported the comments made about the Arrow: "We did a lot of testing and most were successful," said Danny Peretz, the program manager for the Arrow at Israel Aircraft Industries, the prime contractor of the system. "But we know in our hearts, and put it into the design, that this weapon will be tested fully only in war."

However, night vision goggles and Israeli produced drones, according to reliable sources, were part of Israel's technological contribution to the the high-tech efficiency of the allied forces.

In due course, after the Allied Forces remove Iraq's Weapons of Mass Destruction and thoughts are turned to curbing nuclear proliferation the prospect will present itself for a lasting peace between Israel and the Palestinians. The steps to achieve this goal may prove to be easiest to implement in the period immediatly after the war and decreasingly likely as we move away from the fateful days in March. Israel's security is best assured by unilateral action since it has learned that regional arms control depends on dedication to the principle. Israelis have as yet been able to place trust in the integrity of promises from Iran and Libya. However, the disarming of Iraq removes one of Israel's most implacable enemies.

There is skepticism about Arafat's having ceded sufficient power to the newly appointed prime-minister of the Palestinian National Council, for the latter to institute democratic reforms.

The four nation Road to Peace Plan that promises the Palestinians a national homeland may have to consider the

use of force to root out the terrorist factions such as Hizbollah and Hamas while disarming the extreme elements of Arafat's own Fatah. The framers of Oslo Agreement erred in the premature arming of the Palestinians. As much as Israel needs a return to normalcy it will need to show resolve to resist quick solutions.

While quick and imposed solutions may provide temporary relief from terror and suicide bombings, past experience has shown that without addressing basic issues to each side they only sow the seeds for more violence at a future date.

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Terror Enters a New York Conference Room

As a former New Yorker, my visits to that city inevitably conjure up comparisons of the changes that have transpired since my previous visit. My American friends had put me on notice that it was a vastly different New York I would encounter. And so it was.

The wild spendthrift era of the late 1990s and early 2000 was replaced by a much more modest New Yorker whose savings were decimated in the aftermath of the dot.com bubble. "Talk Shows", for example, tended to center on the bargain vacation deals and not on the most recent Broadway hit.

During my stay the stock market nearly daily was falling wildly and only as it became clear that the war was starting did the market spike up higher, for eight consecutive trading days. The recurring theme of polite discussion was the possibility of a terror attack. For several days panic ensued and followed by a rush to buy plastic sheeting and duct tape. A new word had crept into the American lexicon. Discussions of an imminent war, and the subsequent terror attacks against Americans, and what the world would look like in their aftermath, were heard everywhere.

A young Israeli engineer, a founder and CEO of a promising high-tech company, based near Haifa, was on a business visit to New York. The American investment banker prior to hearing the company's presentation perfunctorily asked whether everything was alright back home. He was referring to the suicide terror attack in Haifa the previous day. 15 school children and students including an American student perished, more have succumbed since. "My wife is attending two funerals today," responded the Israeli. The sick smell of death caused by terror, for a moment, filled the opulent conference room.

Investment Outlook

On March 10, 2000 the technology dot.com bubble began to deflate and eventually burst. Three years later...after Nasdaq reached an all-time high...it has since then dropped by 74%. It has been as low as 78%. This loss has only been exceeded by an 89% drop in the Dow Jones Industrial Index, during the Great Depression. The Nasdaq listed biggest non financial companies have lost a combined \$2.5 trillion in value.

Investors, according to stock market specialists, should not



expect an early recovery for their former favorite shares. There are too many issues that require correction, even after many medium sized high-tech companies have disappeared from sight by bankruptcy or delisting. So even after three

years of a down market, we were told by the Sage of Omaha, Warren Buffett, the second richest man in America, that stock prices are still too pricey and that some Chief Executive Officers are still ruling the board room members, rather than the opposite. He also said that despite three years of falling prices.. he still finds only a very few stocks that even mildly interest him. While Mr. Buffett has not been buying new shares for his wildly successful Berkshire Hathaway investment company, that company earned a record \$4.3 billion, up five fold from 2001. Since March 2000 the Berkshire Hathaway shares have gained 57%. It would seem that prudent investing bring excellent rewards. Yet we wonder whether Mr. Buffett's is not only prudent but wily. Instead of stocks, he has been buying junk bonds, debt instruments that provide high yields and carrying the inherent risk of the companies that issued them. According to the BH report, the investment company holds \$8.3 billion worth of junk bonds.

In the past year, the Israeli experience has paralleled that of the United States. We have indicated in 2003 that shares of publicly traded companies, including those of Israeli companies on Wall Street, are too expensive and unattractive and should not interest investors. We do believe however, that pri-

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vate equity investments in Israeli companies, in the biotech and medical device sectors are attractive.

Intel's "Centrino" Chip Developed in Israel

When Intel's new series of mobile Centrino computer chips and products were unveiled in New York with an unprecedented \$300 million advertising campaign, the development team at the company's R&D facility in Haifa celebrated the launch.

The Centrino, unveiled officially on March 12, is the exclusive brainchild of engineers who work at this location. It is there, not only that the Centrino mobile technology but many of the globally used pentium processors were developed. Intel's production plants in Israel export, on the average over \$1.0 billion a year.

Intel's Israel spokesman said that several hundred engineers worked for three years to develop the Centrino.

During the chips' development, utter secrecy was maintained. The code name for the project was "Banias" the name of a tributary to the Jordan River, as reported in the previous issue of IHTIR.

The new Centrino processors are being aggressively marketed around the world, including the U.S., UK, France, Germany, Australia and South Korea. The global cost of advertising could surpass the budget Intel lavished on promoting its Pentium processors.

Intel, the world's largest chip maker, has been operating in Israel since 1974. It employs 5,200 at its four main development facilities and at production centers in Jerusalem, and Kiryat Gat. David Perlmutter, Vice President and General Manager of Intel's Mobile Platform Group, stressed that one of the most important advantages of the Centrino processor, when compared with the performance of its competitors in the mobile computer sector, is its low electricity consumption. He added that the Centrino processor would enable the development of thinner, faster and lighter mobile computers. They are expected to give impetus to "Wireless-Fi", an era of wireless communications within local area network systems. The 3-gigahertz Centrino chips are expected to far outstrip its rivals in speed, with performance close to the latest Pentium 4, while using power sparingly. The new processor is Intel's response to criticism of the Pentium 4, installed in laptops and notebooks, which suffers high energy consumption rates and were considered battery "wasters".

Recently, Intel also revealed its PXA800F processor, code named "Manitoba". It was partly developed in Israel, and is designed to grab a substantial share of the market for advanced cellular telephone processors. It is intended for cellular telephones with multimedia capabilities similar to that of a PDA. Communication companies believe the customers' ultimate ambition is to own a cellular telephone with voice, data communications, multimedia and agenda capabilities; in

short, a cellular telephone which is also a PDA device.

Six Intel development centers across the world participated in Manitoba's creation. Two of them have an Israeli connection: Petah Tikva, and Calgary, Alberta, in Canada, both of which were facilities of the Israeli DSPC company, acquired by Intel in 1999 for \$1.6 billion.

While the Centrino is just entering the market, the Haifa facility is already developing the "Dothan" processor, which will eventually succeed the Centrino.

E&C Medical sells to US MediSys

Israeli company E&C Medical Intelligence, a developer of systems to reduce medical risk, has signed an agreement in principle to install its software with MediSys Health Network. The deal is worth \$3.6 million. This is E&C's third marketing contract with a US hospital network.

The software is designed to reduce malpractice, operating and insurance costs, arising from medical errors. The company is also trying to market its product to US malpractice insurance carriers, which suffer heavy financial damage from medical malpractice.

MediSys manages three medical centers in New York: Jamaica Hospital Medical Center; Flushing Hospital Medical Center; and Brookdale Hospital Medical Center, which handle hundreds of thousands of patients a year.

The company also announced its plans to increase the financing round to \$10 million, in order to expand its US operations. E&C has raised \$15 million to date. Other shareholders are Denali Ventures

and a group of private investors from London.

Medical Device Maker Raises \$4m

Medical device start-up Medigus announced it had completed a \$4 million financing round, at a company value of \$21 million, after the money. Israel Healthcare Ventures led the round. Delta Ventures and existing investors Biocom, ProSeed Venture Capital Fund,

\$2.5 million was raised from new investors, and \$1.5 million from existing investors. "We wanted new venture capital funds to invest in the company, but we did not want to raise more than \$4 million.

The company has developed a system that is intended to replace current invasive surgical procedures for reflux and other gastroesophageal problems. The device is undergoing animal trials in Germany.

Compugen Discovers Antisense RNA

Compugen Ltd. (Nasdaq:CGEN) announced, at the Molecular Medicine Marketplace conference, the discovery that the transcription of antisense RNAs from the human genome, a phenomenon usually regarded as very rare, is surprisingly a fairly common occurrence. Until recently, only tens of genes were believed to have an antisense partner, but Compugen's scientists to date have identified at least

1600 sense/antisense pairs, or 3200 genes, demonstrating that this phenomenon is far more widespread than previously believed.

"Our knowledge of natural human antisense transcription sets the stage for new understandings of gene regulation, including double-stranded RNA mediated gene-silencing pathways such as RNAi. This information on antisense transcription will also provide significant advantages in the design and analysis of functional genomic experiments, as well as for target discovery, protein pathways and antisense drug design. We have begun seeking collaborators for these applications," stated Compugen

In the paper being published in Nature Biotechnology, Compugen's scientists report using their LEADS platform and an "Antisensor" algorithm, designed specifically for detecting genes on opposite DNA strands, to identify 2667 genomic loci with evidence of transcriptional units on both strands from the 40,000 genes identified in the August 2001 draft human genome sequence and the human expressed sequences (82,289 mRNAs and 3,733,145 ESTs).

The experimental work was carried out in Compugen's laboratories in Tel Aviv, Israel, and the design of the "Antisensor" was conducted at Compugen's facilities in Jamesburg, New Jersey.

Teva Invests in Gamida-Cell

Gamida-Cell Ltd. announced that Teva Pharmaceutical Industries will invest \$3 million in Gamida-Cell. Gamida-Cell has developed a technology that expands the population of stem cells with minimal differentiation. It is currently enrolling patients in the U.S. for a Phase I clinical trial of the company's flagship cord blood stem cell product StemEx, for the treatment of advanced stages of hematologic malignancies such as leukemia and lymphoma.

StemEx is the only biological product at the clinical trial stage today, that utilizes a small molecule which enables large-scale self-renewal of stem/progenitor cells ex vivo, in both short and long term expansions.

Pre-clinical results have shown that StemEx(TM) offers a novel solution for the expansion of the cord blood stem cell supply without differentiation.

The first commercial product is expected in 2006.

Independently, Gamida-Cell will continue to focus R&D efforts on developing the company's pipeline of stem cell products, which have a combined estimated market potential of \$30 billion. The technology is applicable to cord blood stem cells in addition to the repair and regeneration of skin, cardiac, neural, liver and pancreatic stem/progenitor cells as well as future regenerative cell-based medicines.

"Teva brings worldwide clinical and manufacturing expertise with a proven track record to successfully launch complex drugs and build them into trusted brand names. We are very pleased to have Teva as a strategic shareholder and potential

partner as they pursue their interest in developing stem cell therapeutics," said Mr. Ehud Marom, CEO, Gamida-Cell Ltd.

Gamida-Cell Ltd., headquartered in Jerusalem, Israel with U.S. operations in Boston, was founded in 1998. Its activities are based on technology for stem cell expansion licensed from and jointly developed with Hadassah University Medical Center, Jerusalem.

Can Trade with India Extend to Non-Defense Items?

Probably not at this stage, but very likely so as the two countries increase bilateral trade and can look back to joint venture successes.

According to estimates, India imports US\$1.5 billion worth of military hardware every year. Analysts state that nearly 70% of the total is accounted by purchases from Israel.

Israel Military Industries (IMI) plans to collaborate with India's defense ministry and will open an office in New Delhi to boost arms sales, estimated at \$1 billion. IMI would not provide details about possible deals with Indian defense companies.

Israeli arms deals with India, include the Barak naval missile defense system and Elta Electronics Industries' Green Pine missile detection radar. Moreover, artillery producer Soltam Systems announced that it had contracted to supply tens of millions of dollars' worth of artillery to the Indian army.

India's software industry has intensified efforts to encourage joint venture projects between Indian and Israeli companies. The Israeli Software Industry has not approved cooperation, citing its doubts about the enforceability of intellectual property rights in the Indian Judicial System.

Guidant to Acquire X-Technologies

Medical equipment maker Guidant Corporation (NYSE:GDT), is buying the Israeli startup X-Technologies. The Israeli company has developed a pull wire for use with catheters in balloon angioplasty.

While exact details of the deal were not available, sources close to the company said, Guidant will pay a cash sum contingent on sales of the FX miniRAIL. The deal is expected to be in the \$140-200 million range.

X-Technologies products will be marketed by Guidant's European distributors. After receiving approval from the U.S. Food and Drug Administration, Guidant will begin marketing them in its primary market – the U.S. Ultimately, the level of sales will determine the size of the deal.

X-Technologies, founded in 1999, has raised \$12 million in financing to date. It has recorded initial product sales in Europe.

Company founders and employees hold an estimated 25%

stake in the company. The remaining shares are distributed among five venture capital backers who invested in the company in November 2001 at a \$35 million pre-money value. Those funds are expected to post two to three times returns on their investment.

Digital Technology Enhances TV

Most camera systems in public places have no way of responding to what they observe. Video companies are beginning to deliver technologies that allow the systems to analyze what they are watching and recording, even as the activity is taking place.

Some of the first versions of these technologies were on display at Homeland and Global Security Summit meeting, a gathering of security professionals and companies that seeks them as customers. NICE Systems, an Israeli company that is a leader in the commercialization of the new technology, demonstrated a camera system, that can tell when a box or suitcase is left unattended in a public space like an airport or train station. The new systems are based on a technique called "content analysis". It has already been used by government agencies for many years.

NICE Systems got its start in the 1980s developing advanced audio recording technology. The company's executives said they were already working with government agencies involved with surveillance.. The New York City 911 system uses NICE's audio-recording technology, as do airport authorities in 38 countries. The Federal Aviation Administration has installed NICE gear at air-traffic control sites in more than 600 airports in the United States.

Until now, however, all of those systems simply recorded information. NICE executives said its abandoned-baggage video system had been tested for several months at one airport in the United States and at one airport in Israel. The company plans to make the technology commercially available at the end of this month.

"The system uses proprietary mathematical formulas to analyze the picture content on a pixel-by-pixel basis," said Aaron H. Chesler, head of North American sales for the company's video and audio recording division.

The company's systems can already be configured to, say, record people leaving a building but not those entering.

Chesler said that a major airport system might include 800 cameras. NICE's systems might already be recording the video feeds from all of them, but the abandoned-luggage or no-parking systems might be installed only on a dozen cameras in crucial areas.

Part of the reason is that the new systems require substantial computing power; a separate computer must be used for every two camera feeds.

In addition, even the smallest professional-grade video recording systems without the content analysis component often cost \$15,000, and can cost \$15,000.

Creating New Jobs in Wales

An Israeli company providing software solutions to the financial services sector is creating a further 124 jobs in Wales.

The decision by FIS-EU of Cardiff follows the success of a 12-month pilot project in the city which has seen the company make significant inroads into the UK and European markets. Minister for Economic Development and e-Business, Andrew Davies, was quoted as saying, "This is extremely good news for the Welsh economy and our drive to ensure that the leading technologies of the future are developed here in Wales.

FIS is a member of the Formula Systems group in Tel Aviv. It is one of Israel's largest information technology software and service operations, employing more than 4,200 IT specialists.

The company produces software packages which will be developed and tailored in Cardiff to meet the individual needs of their client companies and the different industry sectors in the UK and Europe.

Staff expertise will cover a number of IT areas including software development, programming, testing and product support. The decision to open a permanent centre in Cardiff will create new jobs and increase the company's total workforce to 168.

FIS will be serving a large and expanding market - the total UK IT market in 2000 was worth about £55bn - with software and IT services accounting for £22bn.

Given Imaging Gets FDA Okay for Blood Indicator

The Food and Drug Administration cleared Given Imaging Ltd.'s (Nasdaq:GIVN) Suspected Blood Indicator, a new feature of the company's Given Diagnostic System that automatically marks images that correlate with the existence of suspected blood or red areas.

Botticelli Ventures Returns Money to Investors

The media and Internet venture capital fund Botticelli has returned to investors \$25 million of the \$30 million it raised. The company invested \$4 million in two startup companies, Dynamics Direct and Start2Post. It is the one of the few times an Israeli venture fund has shut down down and returned all its funds to investors.

Botticelli was founded at the height of the Internet bubble in 2000 by Amir Goldstein, one of the founders of Amdocs; the American marketing communications company Omnicom Group; and an Israeli advertising agency Gitam.

Pixology Concludes Agreements with Konica and Nikon

Israelidigital photography software developer Pixology, announced a global deal with the photographic manufacturer, Konica. Prior to the Konica agreement, the company announced a deal with Nikon. Both agreements are for Pixology's Intelligent Red-eye Imaging Software Solution (IRISS). Details of the transactions' value were not disclosed.

Pixology's IRISS One-Click software solution for red-eye removal, will be supplied with all Konica R1 Super Minilabs, while Nikon will be the first digital camera manufacturer to offer an automatic red-eye removal system as a standard offering in its camera software, provided with all camera purchases.

Nikon View 6, the new Nikon software utility that will be bundled with all Nikon digital cameras as of March 2003. This will enable Nikon customers to significantly reduce most red-eyes from their digital pictures with either the fully automatic mode or the semi-automatic One-Click feature.

Commenting on the Nikon deal, Pixology CEO Yuval Yashiv said: "Industry figures put the red-eye problem as high as 30% of images captured in winter time. It is even worse in digital cameras compared to the larger film cameras, and therefore it reduces the propensity to print or share pictures".

X-Rays Yield Mechanism of Alzheimer's Drug

A team of Weizmann scientists has gained new insight into the effects of newly approved drug, rivastigmine, in treating slow memory loss Alzheimer's disease, a debilitating brain disease causing memory loss in around 10% of the elderly. The drug, currently sold as Exelon, helps slow memory of Alzheimer patients. Alzheimer's disease involves deterioration of nerve cells, releasing a substance called acetylcholine, (ACh) which carries messages between brain cells.

To explain this at the molecular level, the scientists took snapshots of crystals rivastigmine bound to AChE by projecting X-rays onto crystals of rivastigmine combined with AChE, and observing the X-rays' diffraction patterns.

The lack of acetylcholine as observed in Alzheimer's patients, is compounded by the activity of the enzyme called acetylcholinesterase (AChE), which rapidly breaks it down. The desired effect of Alzheimer drugs like rivastigmine is to inhibit AChE long enough to adequately raise the levels of acetylcholine.

Testing rivastigmine on various types of AChE (extracted from an electric ray, the fruit fly and humans), the team was surprised to find that inhibition was almost irreversible, with little reactivation over a period of days.

NMR -The Movie

Scientists who study the structure and dynamics of molecules, are using nuclear magnetic resonance (NMR) spectroscopy. This technique serves as an essential tool in understanding numerous molecules – including proteins, nucleic acids and active pharmaceuticals in their natural surroundings. It does this by exposing them to electromagnetic radiation and studying the dispersion patterns of the electromagnetic waves that hit the molecules. However, to obtain a full NMR picture of such complex molecules, one needs to perform numerous measurements that are based on the same "serial" principle, as well through "digging" hundreds or thousands of one-

dimensional scans need to be performed one after the other. These scans need then to be combined to create a unified multidimensional picture of the molecule.

A team led by Prof. Lucio Frydman of the Weizmann Institute's Chemical Physics Department has now found a way to perform multidimensional NMR with a single scan. The new method, first described in the December 2002 issue of the Proceedings of the National Academy of Sciences USA (PNAS), is expected to significantly speed up molecular studies, routinely performed in diverse fields. The method "slices" a sample into numerous thin slices and then simultaneously performs all the measurements required by multidimensional NMR – lasting a fraction of a second each – on every one of these slices. Frydman's method may also have a great impact on the design of new drugs and the development of catalysts, particularly in the emerging fields of combinatorial chemistry.

A Biological Computing Device

Fifty years after the discovery of the structure of DNA, a new use has been found for this celebrated molecule: fuel for molecular computation systems.

Whether plugged in or battery powered, computers need energy. Around a year ago, Prof. Ehud Shapiro of the Weizmann Institute made international headlines for devising a programable molecular computing machine composed of enzymes and DNA molecules. Now his team has made the device uniquely frugal: the single DNA molecule that provides the computer with the input data also provides all the energy releasing fuel. The source of the fuel of the earlier device was a molecule called ATP, the standard energy currency of all life forms. The redesigned device processes its DNA input molecule using only spontaneous, energy releasing operations. It breaks two bonds in the DNA input molecule, releasing the energy stored in these bonds as heat. This process generates sufficient energy to carry out computations to completion, without adding any external source of energy.

The device was recently awarded the Guinness World Record for "smallest biological computing device."

A Review of the Development of the Arrow Missile: Israel's Best Defense

Against the rising threat to Theater Ballistic Missiles (TBMs), carrying various types of warheads, Israel Aircraft Industries' MLM Division with its partners developed an effective, powerful and modular defense system. Utilizing the effective ARROW II interceptor, the system detects, intercepts and destroys incoming TBMs and detects a large footprint, allowing the protection of important strategic assets, as well as civilian population centers.

How did the Arrow Missile Program Develop?

The story of the Arrow Weapons System (AWS) began on March 23rd 1983 when US president Reagan delivered his

"Star Wars" speech presenting to the world his vision of a defensive wall that would give the citizens of the free world a defense against Ballistic Missiles.

In 1984 the US Defense Department created a body called the SDIO. The SDIO's job was to administrate the Star Wars activity.

In 1985, the US offered Israel to join the initiative. In 1986 an understanding was signed between the governments of Israel and the US which defined the principles of development that were to come. During the discussions that took place, it was decided that the Arrow system suited Israeli defense needs. The project was unveiled in 1988. In addition, it was decided that the US would fund 80% of the project. Dov Raviv head of the Israel Aircraft Industries MLM Division and the father of the Arrow Missile program supervised the development with creativity and leadership. He ensured that the technology that went into the arrow was State of the Art.

The Arrow had a shaky start and early faults in the system were common. Despite this, it was possible within two years to overcome the problems and test launch the first ever Arrow missile in August 1990. The missile crashed during take off. There were many people who thought the project unnecessary and wasteful, but their doubts about the Arrow disappeared in 1991 during the Gulf War when they discovered that the threat of missiles was no myth, but harsh reality. In the next two tests, errors were discovered in the planning of the thermal defense system characterizing hypersonic missiles which had lead to all previous failures of the system. In September 1992 a successful Arrow missile test was carried out in which one arrow missile was deployed, and in 1993 two tests were carried out with almost total success. In the sum-



mer of 1994 field photographers filmed a historic test launch in which an arrow missile destroyed its target for the first time. This proved that the original concept was working.

Due to several successful tests, the original Arrow missile completed its task as a technological breakthrough. Later, it was to be used as a target missile only. In the series of tests that followed, the capability of the arrow was increased to become a hypersonic missile, proving Israel's technological capabilities. This was a maximal result achieved in minimal time.

The new model dubbed "Arrow 2" had two stages and a wider range. It was capable of reaching heights above those of the earth's atmosphere, and could be launched from a portable launcher with a short response time. In addition it had several other special features which showed how technologically advanced it was.

Between 1995-2000 ten test launches of the arrow missile were carried out which included the launch of a missile (fly-out). A number of tests were performed to examine the system: Nine out of 10 of these tests were successful. Soldiers in the Arrow missile unit carried out the last tests. The last test, which took place on The 5th of Jan 2003, was especially rewarding because the missile was launched under special flight conditions. The test examined how the Arrow could intercept 4 missiles simultaneously, as well as a simulation of a barrage of enemy missiles. The chain of successful tests was extraordinary. They cannot assure 100% success, however they go a long way to add a feeling of security and belief in the Arrow missile system.

In the end of 1997 the IAF announced that it had created a special team which would be in charge of the first Arrow missile battery. In November 1998 a rollout ceremony took place in which the head of Israel's Aircraft Industry handed over the Arrow missile System to the Defense ministry. In September 2000 the arrow system radar identified a scud launching facility in Syria, and in 2001 it discovered another. The Arrow missile became operational in October 2000. In January 2000 The Israel Air Force industry and Boeing signed a deal in which it was agreed that they would both help to manufacture the arrow. During 2002 the framework for the Arrow missile 2 was laid down. Today many countries possess ballistic missiles, and many of these countries either possess or are seeking to develop unconventional weapons. This condition, coupled with the unpredictability of potential adversaries, presents a serious threat to population centers, and high value assets. ARROW Weapon System is the first operational ATBM system in the world being developed specifically to defend against Theater Ballistic Missiles.

2.2 million Internet Surfers in Israel

.2.2 million Israelis over 13 years of age, amounting to 32.8% of Israel's total population, currently use the Internet, according to a TNS Teleser survey for winter 2003. An Internet

user is considered anyone using the Internet for any purpose, anytime, anywhere.

The survey found that 50% of all Jewish households have an Internet connection.

93% of Internet users tend to surf from home, and 53% partly or only surf from other locations. 93% of surfers surf from home, 32% from work, 19% from school or university, and 15% from other locations such as Internet cafes or friends' homes. 7% of Internet surfers never surf from home, but only from other locations.

The survey also found that the most frequent Internet uses in winter 2003 were to find information (86%), e-mail (81%), download content or files (63%), read online newspapers or other news sites (51%), chat rooms (34%), games (42%), buy or order goods and services (35%), make bank or other financial transactions (37%), participate in a forum or discussion group (25%), and listen to the radio (20%).

The commonest kind of information sought online were trips and travel (50%), information about companies, goods or services (30%), statistical or research data (30%), and sports topics (26%).

The current survey found that 35% of all Internet users (11.5% of Israel's population) reported regularly or commonly buying or ordering goods or services online. 47% reported making an online purchase in the past, 41% bought or ordered goods or services in the preceding 12 months, and 11% made a purchase in the month preceding the survey.

The most popular online purchases were electronic products (27%), books (24%), household electrical goods (21%), computers and accessories (18%), music and disks (6%), tourism and recreation (7%). The percentages are the proportion of online buyers purchasing these items in the preceding year.

The TNS Telesaker Internet survey is a periodic telephone survey of an updated national representative sample of individual Internet users over the age of 13. The current survey

covered 850 of Internet users over the age of 13 from Jewish communities across Israel.

Israeli Weapons Systems in Use in the War in Iraq

Israel has acceded to America's request not to participate directly in the War in Iraq. An Israeli participation is viewed as an unnecessary provocation of America's Arab and Muslim coalition partners. Of the more than 50 Coalition Partners of the United States only Great Britain and Australia have contribute soldiers. Other nations have allowed over flights of their territories or the use of air basis for American planes and personnel.

Yet, though without a direct role, Israeli defense technology and expertise has is found its way in many important weapons systems employed by the United States in the War in Iraq. Originally these weapons were developed to protect Israel and have proved their worthiness in battle. The process leading to their inclusion in the American weaponry was a result of many years of collaboration, testing, trials and accreditation procedures preceded their adaptation. Israeli weapons designers took into account the country's small population and sensitivity to the loss of life. This suited the American doctrine. Consequently, Israel weaponry and arms technology, which has been incorporated into the U.S. military establishment, is being used in the war against Iraq.

One such system is the Israeli-designed HUNTER RQ-5 Alpha unmanned aerial vehicle in use by the U.S. Army to scout Iraqi defenses.

Israel and the United States are developing an air-to-ground missile for the F-16 multi-role fighter. The missile is called the HaveLite and is a smaller and lighter version of Israel's Popeye missile. The Popeye has been deployed on the F-15 fighter-jet, however, it is regarded as too heavy for the small-



er F-16. The HaveLite development program is a joint venture of Lockheed Martin and Rafael, Israel Armament Development Authority. About three years ago, both companies signed an agreement to develop a lighter version of the Popeye, called the AGM-142 in the United States, for the F-16.

Night vision goggles are in use by American forces Iraq. While not publicly reported it is very likely that the American Army's Bradley fighting vehicles are guided by on-board computers supplied by a subsidiary of Israel's Elbit Systems, according to reports published the Jaffee Center for Strategic Studies at Tel Aviv University. The Center publishes authoritative statistics about the military capabilities of the countries of the Middle East.

According to Jane's, Israel made more than \$3.5 billion in arms sales last year, approximately equal to Russia's massive arms export industry. Only the United States and Britain sold more, Jane's reported. Besides the United States, Israel's top customers include Turkey, India, Brazil, Canada and Germany.

Israeli Telecom Market in 2002

An IDC Israel survey estimated that the Israel telecommunications market grew 1.2% in 2002, compared with 7.5% in 2001. The study reports and analyzes data from 2001-2002, and provides forecasts for the line and wireless telephony markets in 2003-2007, divided into voice and data communications.

Data communications is the telecommunications market growth engine, with a forecast annual growth rate of 31.2% through 2007. Wireless data communications revenue accounted for almost half of the data communications total. The survey predicts this segment will average 43% growth per year through 2007.

According to the survey, Israeli telecommunications market revenue amounted to \$3.78 billion in 2002, \$2.6 billion of which, amounting to two thirds, came from cellular communications, and \$1.17 billion from fixed-line communications. The latter figures reflects a 3.3% decline in spending on fixed-line communications in 2002, attributable to increased use of cellular telephony, lower rates for fixed-line calls, and the adoption of broadband hookups by Internet users.

Annual growth in fixed-line communications revenue is expected to average only 1.9% in the coming years, compared with 5.4% growth in the cellular communications market.

IDC Israel research manager Gideon Lopez told "Globes" that the reason for the wide gap between 2001 and 2002 was the saturation in the cellular market. New cellular subscribers numbered only 864,000 in 2002, compared with 1.071 million in 2001. Lopez added that the type of new subscriber had also changed; as the market approaches saturation, new subscribers tend to be users of emergency services and children, and to include an ever-increasing proportion of prepaid users. These categories produce less revenue.

The survey indicates that cellular market revenue grew from \$2.52 billion in 2001 to \$2.603 billion in 2002, a 3.3% increase. Cellular revenue rose 8.9% in 2001.

The big profits in the cellular market in 2002 were the cell phone manufacturers and marketers, who sold nearly two million phones. 420,000 subscribers were recruited to the new interim generation networks, including 410,000 to Partner Communications (Nasdaq: PTNRLSE:PCCD) and Cellcom's GPRS networks, and 10,000 in the Jerusalem region for Pele-Phone's 1x CDMA network.

After years of continuous growth in the voice services market, revenue slipped 1.1% in 2002. This market is expected to remain unchanged through 2007, with 0.3% average annual growth.

IDC Israel believes that opening the international communications market to competition will lead to market restructuring and consolidation. IP-based communications will revolutionize the market. "The trend towards using IP-based communications for internal enterprises and international communications in the Israeli business market is accelerating, and overtaking systems of the conventional telephony providers," Lopez noted. "This trend will broaden, to the and negatively affect Israel's Telecommunications giant Bezeq.

THE WAR AND ITS AFTERMATH

Shai Feldman

Jaffee Center for Strategic Studies

There is little doubt that the superiority of U.S. and British armed forces will enable them to defeat the Iraqi military formations arrayed against them, particularly those outside urban areas, and achieve the immediate objectives of the campaign: the removal of Saddam Hussein, his sons and cohorts from power and the destruction of Iraq's stocks of weapons of mass destruction (WMD) and the production facilities. But the future of Iraq and of the Middle East at large are likely to be affected by a much wider array of factors and considerations, and the ability of the coalition to translate its expected military victory into more comprehensive and durable political achievements remains unclear.

The coalition forces' most difficult test will be their ability to avoid an entanglement in the heavily populated urban area of

Baghdad that might be associated with considerable American, British, and Iraqi civilian casualties. Heavy allied casualties could erode the domestic support needed to sustain the campaign until its political and strategic objectives are achieved. In this respect, the danger is not that Baghdad would become another Stalingrad but rather that the battle in Baghdad would become a larger-scale repeat of what was experienced in Beirut, Mogadishu, and Jenin.

And heavy Iraqi civilian casualties will undermine the coalition's ability to affect Iraq's future and influence the political landscape of the Middle East in the aftermath of the war because horrific images of war will be broadcast to Arab homes throughout the region by the new regional media, notably Al-Jezira television. If this occurs, it will be exceedingly difficult for the Bush Administration to persuade Arab publics that the war was truly intended to liberate the Iraqi population and equally difficult for Arab leaders to prevent a further outpouring of anti-American and anti-Western popular emotions – the first manifestations of which were already seen during the past few days in massive street demonstrations, especially in Cairo.

The third major variable is the extent to which the coalition will succeed in destroying the military and security forces loyal to Saddam Hussein – principally the Republican Guard divisions – while keeping a sufficient number of other Iraqi military units intact. The purpose of this would be to prevent the disintegration of Iraq and a bloodbath that might well take place in the aftermath of Saddam's downfall.

Unfortunately, other than the military there is no institution in Iraq capable of holding the country together. Consequently, the destruction of the army would mean the disintegration of Iraq, with the establishment of a Kurdish state in the north and a Shi'ite state associated with Iran in the south.

This would completely alter the balance of power in the Persian Gulf and would be particularly destabilizing given that it would coincide with Iran's rapid progress toward the acquisition of a wide array of WMD and delivery systems, including ballistic missiles. Anticipating these destabilizing effects, Turkey is already reported to have moved forces into northern Iraq, in the hope of preventing the creation of an independent state of Kurdistan. The alarm with which this move was greeted regionally and internationally points to the different dangers involved in Iraq's possible disintegration.

Finally, the region would be affected by the speed with which the coalition withdraws the bulk of its forces from Iraq once Saddam Hussein and his cohorts are removed from power and Iraq's WMD and the facilities for their production are destroyed. An extended presence of coalition forces in Iraq, in a futile attempt to transform the country into a western-style democracy, is likely to result in a political catastrophe. Such an extended presence will make the coalition partners – primarily the U.S. and the U.K. – responsible for the wellbeing of Iraq's civilian population. In the Arab world, such a presence

would be depicted as "occupation," providing more ammunition for the opponents of the U.S. to argue that the war was launched in order to restore western colonialism in the Middle East and to gain control over the region's oilfields. Conversely, if none of the possible negative developments enumerated here materializes, the effects of the war on Iraq's future as well as on the Middle East at large are likely to be very positive.

To recount, this would require that the war is executed swiftly and successfully, with few casualties among coalition troops and among Iraq's civilian population; with enough of the Iraqi military intact to prevent the country's disintegration; and with a rapid withdrawal of most coalition forces from Iraq before they are widely seen as "occupiers" of Arab land.

Should this best-case scenario materialize, the U.S. would be in a far better position to affect political developments in the region. Specifically, it would allow the Bush Administration to restart the Middle East peace process well before the 2004 elections, thus reversing the deadly course that Palestinian-Israeli relations have taken since September 2000. It might also cause Iran to reconsider its support of terrorism and the development of WMD, so as to avoid giving reasons for the Bush Administration to move against a second member of the "axis of evil." For similar reasons, U.S. success may well lead Syria to reevaluate its support of Hizbullah and its alliance with Iran.

More broadly, effectively transforming Iraq into another Egypt will change the balance of forces in the Middle East. Iraq, a country that combines a robust population base with huge potential wealth, will have been transferred from the "axis of evil" to the coalition of the "good guys" – Egypt, Jordan, and Saudi Arabia, who supported the Saudi peace initiative in the March 2002 Beirut summit of the Arab League. While such a change will fall short of transforming the region's states into pluralist democracies, it would promise to affect positively many facets of political life in the Middle East.

The above article is a thoughtful analysis of the ongoing events and focuses on various aspects of the War In Iraq and possible scenarios in its aftermath. Shai Feldman is a respected member of the Jaffee Center and IHTIR is pleased to make available to our readers his penetrating analysis and his projection of various scenarios for the Aftermath of this War.

Introducing the Winners of the Israeli Outstanding Incubator Enterprises for 2002

Israel's Trade and Industry Ministry honored four outstanding Technological Incubator enterprises in this year's annual award ceremony at Kibbutz Shfayim: Mazor Robotics (from

the Haifa Technion incubator), Mind Guard (from the Nayot incubator near Nazareth), Lithotek Medical and A-Trap - both from the Golan incubator Meytag.

Israel's 24 technological incubators house some 200 ongoing projects, with a success rate above 50 percent - high by any standards in the world.

Investment in R&D is essential for Israel's long-term economic prospects - especially as we have no natural resources other than brainpower," said Eli Ofer, Chief Scientist at the Trade and Industry Ministry, in his address. "R&D is the most important aspect of infrastructure for future economic growth."

A tiny robot that directs surgical tools with greater precision than a surgeon's hand.

Mazor is perfecting a surgical device that may become commonplace in tomorrow's operating theaters - a tiny robot attached to the patient's body (usually to the spine) that directs surgical tools with greater precision than a surgeon's hand.

"We saw the need to leave academia and develop into the framework of a private company," said Mazor's initiator, Profesor Moshe Shaham. "Our decision to apply to the incubator was definitely a good one - it saved many headaches in the early stages of the product."

Founded two years Mazor has raised \$4 million from Private Equity Funds and linked with several medical centers in Israel and abroad. The company's first products are due to reach the market in about 18 months.

An artery filter that helps prevent strokes.

Mind Guard, mow out of the incubator and located in Caesaria- employs 30. It has designed what is described to ne a revolutionary artery filter that helps prevent strokes - and could evolve into a permanent solution. "Everyone told us that our idea was impossible and hopeless," recalled company chairman Dr. Ofer Yodfat. "Four years later, we have proved the efficiency of our products."

Mind Guard's filter redirects potentially dangerous brain-bound blood clots from major arteries into smaller blood vessels, and could prove a permanent solution for high-risk patients. The company has already raised over \$10 million in outside investment.

A device that detects and destroys kidney stones.

Lithotek has developed a medical device that complements endoscopes by detecting, destroying and removing kidney stones using a unique "basket" less than one millimeter in

diameter.

"We are part of a cooperative program with incubators in Siberia," explained Lithotek's Dr. Valerie Diamant, an immigrant from the former Soviet Union.

Less than two years old, the company has already signed a worldwide marketing agreement with the US-based Cook Urological worth \$3.5 million, and recently dispatched the first products from its new manufacturing facility in Katzrin.

And an environmentally friendly mosquito trap.

The brainchild of Prof. Meir Shinitzky of the Weitzman Institute, Dr. Gunter Muller of the Hebrew University and Miri Simchoni-Barak of Kibbutz Yiftach, A-Trap started as an experiment conducted in the kibbutz's laboratory five years ago.

"There are several ways to attract mosquitoes and other blood-sucking insects," explained Muller, the company's scientist. "They are drawn by Carbon Dioxide (CO₂) in breath, the heat of warm-blooded animals, bodily odors and even shapes, movement and color contrasts. Our trap mimics all these with a heating device and our patented biochemical processes that emit CO₂ and odors."

The unique device involves the fermentation of natural food-stuffs. "Rather than smelling like old socks, it gives off a pleasant, fruity-beery odor," said Muller. "Unlike most chemical- or UV-based traps, it is safe to use indoors and does not attract beneficial insects, thereby causing no environmental imbalance."

A prototype trap was extensively tested in Florida, Israel and Germany, and the patent can be adapted to attract specific flies, insects or bloodsuckers. The company's second product - a trap for flies only - is under development.

A-Trap recently signed a long-term marketing contract - worth \$55 million over the next five years - with Florida-based Lentek International that manufactures and markets consumer products across the United States and in 67 countries. The connection between the companies was facilitated by Performance Systems, which has helped over 100 Israeli companies penetrate US markets.

The moveable trap is suitable for both indoor and outdoor use, and may soon become a fixture of every family picnic. "We expect to sell hundreds of thousands of dispensers and millions of refills," said A-Trap's Chairman Ami Regev. "We're thinking in international terms.

The company is currently negotiating a European distribution agreement with the German-based Neudorf, and our next target market will be Australia."

A-Trap graduated from the Golan incubator last summer, and is to open a new marketing center in Kibbutz Hachorshim.

SuperCom to Trade on Swiss OTC Market

Israeli SuperCom (Nasdaq Europe: SPRC), a provider of smart card systems, said that its shares would be listed shortly on the Helvetica over-the-counter stock market in Switzerland.

The Helvetica market lists small to medium cap shares and is managed by Bondpartners SA of Lausanne, which has agreed to become a market maker in SuperCom shares, the company said.

SuperCom has previously reported that it signed a distribution agreement with US based TransTech Systems. Under the deal, TransTech Systems (TTS) will broaden the distribution of SuperCom's access control systems based on contactless smart card and fingerprint verification solutions in the US.

The agreement covers the company's SmartGate 2400 and EduGate solution, including the Smart Card series 8500.

Chiasma Secures \$2m from InnoMed

Israeli biotechnology start-up Chiasma has completed a \$2 million seed round. InnoMed, the Jerusalem Global Partners life sciences fund, made the investment.

Jerusalem Global Ventures general partner and InnoMed fund manager Dr. Dalia Megiddo twelve months ago provided Chiasma's founder an initial small sum of money and challenged him to demonstrate that the venture was viable. After this was successfully accomplished, the fund decided to invest. Chiasma is currently testing the technology on various proteins and vaccines.

Chiasma develops solutions for delivering protein-based drugs in a non-invasive manner. The company technology is designed to enable drugs to reach the bloodstream without an injection. Proteins taken orally usually dissolve while still in the intestine, without entering the bloodstream. The need for injections is becoming more acute, because most new drugs in use or being developed are protein-based.

Megiddo said Chiasma was exploiting a natural process, in which whole proteins pass through the digestive system the spread of infectious intestinal diseases. From the DNA of these germs, which are able to pass proteins through the digestive system, the company produces peptides that attach themselves to the proteins, and bring them to the intestine.

CEO Guy Yachin and CTO Prof. Shmuel Ben-Sasson a researcher at the Hebrew University of Jerusalem founded Chiasma in 2002. Yissum Research Development Company of the Hebrew University is part owner. Chiasma has six employees.

The Israel High-Tech & Investment Report is a monthly report dealing with news, developments and investment opportunities in the universe of Israeli technology and business. While effort is made to ensure the contents' accuracy, it is not guaranteed. Reports about public companies are not intended as promotion of shares, nor should they be construed as such.

Fruit for Diabetics Developed at Vullcani

The pepo is derived from the South American pepino dulce fruit.

Diabetic sufferers, whose diet generally does not allow the eating of fruit due to their high sugar content, can now enjoy the pepo - a fruit developed at the Vulcani Institute (Agricultural Research Organization).

The Israel Diabetics Association tested the pepo and found it edible by diabetics thanks to its low sugar content. The pepo is also said to be tasty.

The pepo originates from the South American pepino dulce fruit, but its flavor is supposed to be better than the original.

Pepo's developer, Dr. David Levy said, "I first ate the pepino dulce for breakfast while in Peru. The fruit we developed looks and tastes different."



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