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The Technion: Israel's Hard Drive

By DANNA HARMAN

WHEN the Technion class of 1957 graduated, its members got together and wrote a letter of complaint to their prime minister, David Ben-Gurion, who was otherwise busy building a nation. "There were no jobs for us in our fields," recalls Gideon F. Inbar, an electrical engineer who is now 79. "My wife kept saying, 'Oy, things are grim, grim, grim.' "

In 2013, the student body has pretty much the opposite problem.

"Officially, the rule is that first- and second-year students should not take outside jobs," says Peretz Lavie, president of the Technion-Israel Institute of Technology, Cornell's partner in creating an ambitious graduate school for applied science and engineering in New York City. Mr. Lavie, a psychophysiologist who periodically ducks out of his roomy hilltop office to check in on his sleep-disorder laboratories and two start-up companies, acknowledges that exceptions are made. Often. Because getting out and ahead in the work force is, in many ways, the very idea.

"They turn a blind eye," says Asaad Malshy, 24, who is studying physics and electrical engineering while working two afternoons a week at Intel, one of Israel's largest employers. "I used to dream that I would finish university and get a job in high tech," he says, "until I realized the dream was already in reach."

It's a weekday evening during exam period. Mr. Malshy is at the game center in the student union, where young men and women are slouching on couches behind Falcon flight simulators or facing off in FIFA 13 soccer matches on a wall of monitors — each one with a knapsack still strapped firmly onto both shoulders.

"It's a pressure cooker here and doing O.K. requires a lot of effort," Mr. Malshy says. "This university consumes you, and you don't get a break if you have a job, or even if you start your own company." He adds with a grin: "You still have to pass advanced integral algebra."

But if the Technion refuses to coddle its charges — about 9,000 undergraduates graduate students — Intel, I.B.M., Microsoft and Yahoo and the like make up for up offices along a direct bus route from student housing, recruit heavily from th

and offer working hours that take those advanced integral algebra exams into account.

Much as Silicon Valley popped up around Stanford, and Route 128 came to symbolize high technology because of its proximity to the Massachusetts Institute of Technology, so the Technion has transformed the sleepy northern city of Haifa into a buzzy high-tech center.

In a country known as start-up nation, this is not the only university where students can bury themselves in robotics, engineering and computer science labs, but it is generally considered the best. When M.I.T. is mentioned in a movie showing in Israel — "American Pie," for example — the Hebrew subtitle simply says "Technion."

Conceived by the Zionist Congress in 1905, in part as a response to the exclusion of Jews from engineering studies in Europe, the Technion finally opened in 1923, when there were no Hebrew words for most of the technical terms needed to teach a basic engineering class. Since then, the university has come up with more than just translations for "aerodynamic" and "nuclear."

"I can say without exaggeration that Israel could not have been built without the Technion," says Yossi Vardi, who has founded or helped build more than 60 companies in Israel and has five degrees from the Technion. "There is a Technion graduate behind practically every highway, desalinization plant, new missile technology and start-up company in the country."

This is not mere school spirit talking. According to Shlomo Maital, senior research fellow at the Samuel Neaman Institute for Advanced Studies in Science and Technology, a fourth of the university's 60,000 alumni who are of working age have, at one time or another, initiated a business, and a fourth are C.E.O.'s or vice presidents. The annual output of graduates in high-tech industries is estimated to be at least $21 billion. Among inventions from Technion research labs: the memory stick, drip irrigation, the Parkinson's drug rasagiline, the iron dome air defense system and instant messaging.

"Just *how* does the Technion do it?" Mr. Lavie asks himself, clearly amazed.

EMBEDDED in the Haifa curriculum is learn by doing. Interdisciplinary courses that combine business and innovation — like "Technological Entrepreneurship," taught by Dan Shechtman, a Nobel laureate in chemistry — are the most popular on campus.

The curriculum at the Technion-Cornell Innovation Institute will be similarly multidisciplinary. The institute is a major component of the new Cornell Tech campus scheduled to open on Roosevelt Island in 2017 and currently being rolled out in temporary

headquarters in Chelsea. Craig Gotsman, a Technion computer science professor with two start-ups under his belt, will direct the institute, which will ultimately be responsible for a third of the academic activity on campus. Next year, the institute will begin recruiting students who are interested in "connective media," one of three focal hubs (the others: "healthier life" and "built environment").

The hope is to build an ecosystem like Haifa's, where industry and academics feed off each other. And, says Mr. Gotsman, "to provide the necessary background and skills to top off the typical science/engineering degree offered in the United States, which, while providing fundamentals, does not fully prepare students for hands-on, cutting-edge work in an industrial environment."

Mr. Vardi, a Technion board member and one of Israel's most high-profile entrepreneurs, puts it more simply: "What the Technion is really bringing is its genes. It's like bringing in genes from outside the family." When tasked with explaining where the innovative fervor comes from, Israelis often refer to DNA — a belief that there is something genetic in the determination of its students.

"Teaching entrepreneurship is extremely difficult," says Saul Singer, co-author of "Start-Up Nation: The Story of Israel's Economic Miracle." "But it is clear that to succeed in it, your students have to understand something about being on a mission. You have to know what it is to be part of something larger than yourself." Immigrants and soldiers, he says, understand. Military experience, mandated in Israel, instills leadership, teamwork, improvisation, obedience and sacrifice, and means students are older and more focused. Israel is also a country of newcomers, he adds, hungry for success, willing to take risks and good at adapting to new situations.

Alon Wolf, who directs the biorobotics and biomechanics lab at the Technion, has another theory. "People say it's the army, or the stressful, uncertain life in Israel that makes youngsters resilient and pushes them to think out of the box and find a way ahead," says Professor Wolf, who of course has a promising start-up of his own. "But I'm telling you, it's the Jewish mother. I look at my wife" — who happens to be an industrial engineer at the Technion — "she is on the kids' case day and night. Did you do your homework? Good. Now, what was it about? Why did they give you that homework? And what about your extracurricular activities? Tell me about that."

Others talk of chutzpah, the same cultural trait of audacity and arrogance that propelled the class of 1957 to write to the prime minister to complain about not finding good jobs, and that

continues to propel so many current graduates as they charge into industry.

"Israelis will not hesitate to tell me how wrong I am, even though I have gray hair and 40 years of experience," says Mr. Maital of the Neaman Institute, who was born in Canada and has taught at universities around the world, including M.I.T. "They are not afraid of risk, and will start companies even though the odds are against them. And they will not hesitate to leave a well-paying job if their innovative ideas are shelved."

Mr. Malshy doesn't buy into the chutzpah culture. He does not have a Jewish mother, did not serve in the army and is not an immigrant. Like 20 percent of the Technion student body, he is Arab. To the question of what creates the bubbling innovation on campus, he responds that it is just something taught. No DNA involved. "They take students who are already talented and at the top of the class," he says, "and then hammer excellence into them, and not just excellence, but the expectation of innovative thinking. That's what happens to us."

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