Building for change

THE PORTER SCHOOL OF ENVIRONMENTAL STUDIES AT TEL AVIV UNIVERSITY

The Porter School of
Environmental Studies
ביה"ס ללימודי הסביבה ע"ש פורטר

Tel Aviv University
אוניברסיטת תל-אביב

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PREFACE

This book is a history of the Porter School of Environmental Studies since its inception at Tel Aviv University more than a decade ago: its donor's initiative, vision and determination, its origins and the stages of its development and implementation, its role in Israel and in environmental research and education globally, and its team of dedicated researchers, teachers, students and administrators all working together toward a common goal.

The Porter School's concept of environmental education focuses on three factors: knowledge, ethics, and creativity, categories that are necessarily intertwined. The following chronicle of events, people and ideas reflects this concept that is the School's signature. It conveys an attitude toward life on our planet.

Knowledge

The creation and evolution of the Porter School has been a learning process that we would like to share with others who might want to embark on a similar project of interdisciplinary research and teaching. In a global era, universities around the world share many qualities and structures despite the particulars of place and history. Sharing knowledge and experience is an inherent feature of our view of environmental studies.

Ethics

Creating a school that challenges departmentalized ways of thinking and promotes environmental awareness – from its programs of study to the sustainable building that houses them – is possible only by collective effort. From the standpoint of the Porter School, an ethical approach to the practice of environmentalism requires respecting and valuing the work of all who contribute to its success. This history of the Porter School acknowledges the many people who help make the School a reality.

Creativity

Creativity is the antidote to indifference. Innovation comes about because someone takes an initiative, because they care. This history documents innovation as an optimistic act. Just as the Porter School of Environmental Studies believes that environmental knowledge emerges when disciplinary lines are crossed and different points of view are brought together, so too the story of its inception and development demonstrates the creativity generated by collective aims and efforts.

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The Beginning

Dame Shirley leading a clean-up campaign in London

Dame Shirley at the construction site of the Porter School Building

Sometimes a random remark can spark a dream. For Dame Shirley Porter, a stroll in Westminster may well have been the catalyst for more than forty years of commitment to the environment. In 1970, Dame Shirley was walking with her sister-in-law, Potter Green, in Hyde Park, and lamented that "the city is neglected and far too dirty." "Well," replied her sister-in-law, "if you feel that way, why not try to do something about it?" The origin of the Porter School of Environmental Studies can probably be traced back to that day, that observation, and that challenge.

dream

THE SEEDS ARE PLANTED: THE LONDON EXPERIENCE

As a Hyde Park councillor in the Westminster City Council upon her election in 1974, Dame Shirley did indeed set out "to do something about it," beginning an uncompromising and unrelenting battle for a cleaner London. In 1977, as chairperson of the Highways and Works Committee, she introduced the Cleaner City Initiative. She was convinced that raising awareness was a critical first step, and was not averse to using, in her words, "somewhat flamboyant efforts" to draw attention to issues she deeply cared about – primarily litter and its impact on the quality of life. Her lively and varied campaigns and promotions included demonstrating a new machine that could clean under parked cars to Prime Minister Margaret Thatcher outside 10 Downing Street and mobilizing schoolchildren to join an anti-litter campaign by raising brooms and singing "Find a bin and put it in!" as they accompanied Dame Shirley through the streets of Westminster.

In 1983, Dame Shirley was elected Leader of the Council. Known as the "Thatcher of Local Government," she was keenly interested in how cities functioned in terms of transportation, environmental infrastructures, and maintenance and repair systems, and was committed to finding ways to make them more efficient and cost-effective. She believed that the involvement of everyone who lived and worked in Westminster, and the legions of people who visited every day, could create an environment to be proud of.

All aspects of the city came under her purview; no urban facet escaped her scrutiny. What was the condition of public toilets? What could be done about potholes? She mounted a campaign against drugs; brought sex shops under scrutiny; provided new uniforms for street cleaners; went down into the sewers to check them out. Councilwoman Porter left no stone unturned.

Her far-reaching efforts were lauded at the launch of the "Tidy Britain" campaign in 1988 when Prime Minister Thatcher voiced her gratitude "to Shirley Porter and the Westminster City Council for their tremendous initiatives…" in helping restore Westminster to a beautiful and livable city.

In 1990, she was appointed Lord Mayor of Westminster, and a few months later made a Dame of the Order of the British Empire in recognition of her long-term contributions to Westminster and, particularly, her work on behalf of the environment.

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SUPPORTING ISRAEL - AND ITS ENVIRONMENT

Dame Shirley's association with Israel predates her political service in London. As early as 1955, she co-founded with her sister, Irene, the 55 Group WIZO. One of its first donations was to the Jerusalem Baby Home; presciently it involved dustbins. She was ever ready to support projects not deemed "sexy" by the average donor, and she fondly recalls the "Clean Toilet Competition" she initiated some years later at Tel Aviv University.

Dame Shirley's burgeoning interest in the environment coincided with the emergence of the environmental movement in Israel. One of her first concerns was the lack of litterbins, especially on beaches. In 1981, a letter signed Councillor Shirley Porter J.P., was published by *The Jerusalem Post*. In it, Dame Shirley urged Israel to try something along the lines of Westminster's successful Cleaner City Pilot Scheme: "… there was much scepticism as to its implementation… now we have proved that people will keep their environment tidy if there are litter bins available."

When she discussed with Aura Herzog, founder and president of the Council for a Beautiful Israel (CBI) and wife of then President of Israel, Chaim Herzog, the idea of providing decorated bins similar to the ones used by Westminster Council, she was introduced to an unexpected reality of living in Israel: in a land where terrorism is a continuous threat, only transparent bags or bins were possible; Israel could not take the risk of having a refuse bin serve as a hiding place for a bomb.

Mrs. Herzog introduced Dame Shirley to other unique aspects of Israel and its environment. One was Israel's 1960s campaign against picking wildflowers. Dame Shirley was impressed by its success, which is responsible for people continuing to flock to see the proliferating wildflowers every spring, and her understanding of the impact of raising environmental awareness, born of her years on the Council, was reinforced. Determined to find other ways to change people's attitudes

Dame Shirley and Dr. Arie Nesher

and behavioral patterns, she began by dedicating an education-environment pavilion at the CBI.

Becoming a champion for environmental change in Israel was catalyzed by meeting **Dr. Arie Nesher**, an architect and city planner, who had served as the chief architect of Project Renewal in the 1980s, the flagship urban renewal project of the State of Israel and the Jewish Agency.

With their mutual interest in city life and the environment, Dame Shirley and Dr. Nesher joined forces when Israel's fledgling environmental movement was just getting underway. A Ministry of Environmental Protection was established in Israel in December 1988, public awareness of the need for environmental protection began to emerge and non-governmental environmental organizations started to take root. Dr. Nesher accompanied Dame Shirley throughout the country, forging contacts with the fledgling organizations. She learned about the Society for the Protection of Nature in Israel (SPNI), the country's veteran environmental NGO which was instrumental in first raising public consciousness of nature and environmental protection in Israel, the Israel Union for Environmental Defense (IUED), Israel's first public interest environmental advocacy group and the Heschel Sustainability Center, dedicated to building a sustainable future for Israeli society through education and activism.

Dame Shirley's interest in the environment paralleled the entrance of additional philanthropic organizations into the arena. In fact, to help better respond to Israel's environmental problems, studies were commissioned by some of these philanthropic organizations in the 1990s to discover the gaps in non-governmental activism and propose priorities for funding in several key areas. Philip Warburg, then executive director of the IUED, created a forum of major donors to help impact the environment, and the Porter Foundation stepped up its involvement in Israel's growing environmental movement.

FIGHTING LITTER

Friday 9th Jan 1981

To the Editor of The Jerusalem Post

Sir, — On my recent visits to Israel, I have been very encouraged by the increased interest which people are showing towards a cleaner environment. The problem, of course, is that, in these days of financial stringency, the allocation of funds to preventing the spread of litter is frequently put at the bottom of the priority list. Yet I am sure that cleaner streets and public facilities will encourage people to take more pride in their environment and country.

Your readers may therefore be interested in the "Cleaner City Pilot Scheme" which is currently being run by the Westminster City Council. The scheme involves public and voluntary organizations as well as private enterprise in keeping clean an area covering two and a half miles around Leicester Square, the heart of the West End. During the past year the scheme has attracted national attention as a result of its success in keeping this famous area clean and litter-free.

An essential part of this campaign has been the sponsorship of litter bins by private businesses. This has taken the financial burden of providing an expensive piece of street furniture from the local council and reduced the cost of litter collection to the public. Since local authorities in Israel are facing similar financial problems as those in other countries, I wonder whether this approach to private sponsorship might be of interest to local authorities in Israel.

Of course, I realize that litter bins present a security issue. But in Westminster, we have had to cope with a similar situation due to the IRA bombings. In fact, at one stage, all the litter bins in the London Underground stations in the Westminster area were removed for security. The immediate result, however, was a deterioration in cleanliness and increased litter. So, in spite of initial fears in some quarters, the litter bins were put back and so far, the fears have proved to be groundless.

When the Cleaner City scheme was conceived, there was considerable scepticism as to its implementation. Everybody agreed that a litter free environment was a good thing, but very few thought that much could really be done about it. Now we have proved that people will keep their environment tidy if there are litter bins available.

Councillor SHIRLEY PORTER, J.P.,
Westminster City Council,
Chairman, Highways and Works Committee,
Chairman, Cleaner City Pilot Scheme
London.

CLEANING UP THE YARKON RIVER AND ITS ENVIRONS

The Rowing Center benefits people from all walks of life and brings joy to many in Tel Aviv. The Porter family is delighted with the Center but makes it clear that the vision alone was not enough; the right partners were needed to make it happen.

Most of the Porter Foundation projects were focused in the Tel Aviv area. Foremost among them was the cleanup of the Yarkon River and its surrounding area. The impetus for the initiative was born of tragic circumstances. Dame Shirley's grandson, Daniel Amichai Marcus, a potential Olympic rower who had made aliya (immigrated) from Britain, was killed in a car accident in 1993 during his army service. In his memory, the family decided to establish a center for rowing and nautical studies bearing his name on the north bank of the Yarkon River.

Dame Shirley recalls an exploratory boat ride on the Yarkon. She was appalled by the sights and smells: a maintenance depot was an eyesore on prime land along the river; there were waste dumps to the north; drug addicts congregated under the Yarkon Bridge; and litter covered everything. To make matters worse, the river was heavily polluted and hazardous for people to use. Dame Shirley wasted no time in pushing for change. She made clear that the family's commitment to establishing a rowing center that would benefit the community would be contingent upon cleaning up the site and rehabilitating the Yarkon's northern and southern banks.

Dame Shirley approached every relevant official at both municipal and national level. She called on Tel Aviv Mayor Roni Milo, who agreed to allocate the land. She then got the attention – and the cooperation – of his successor, Mayor Ron Huldai. She spoke to the director of the Yarkon River Authority, David Pergament. She contacted the director general of Israel's Ministry of Environmental Protection, Dr. Israel Peleg, and the Minister of Environmental Protection himself, Mr. Rafael (Raful) Eitan. The Foundation created a non-profit association, Friends of the Yarkon River, and involved NGOs, such as the SPNI, in the endeavor. Dame Shirley also reached Benjamin Netanyahu during his first term as Prime Minister in her effort to secure government funding for the Yarkon rehabilitation project. All became partners in her vision.

A special exhibition at the CBI followed, with the participation of Environmental Protection Minister Eitan, and in 1996, the Israel government approved a master plan for the Yarkon River that called for the conservation of the river and its vicinity as the "green lung" of the Tel Aviv metropolitan area. Slowly, the Porter family's vision was becoming a reality.

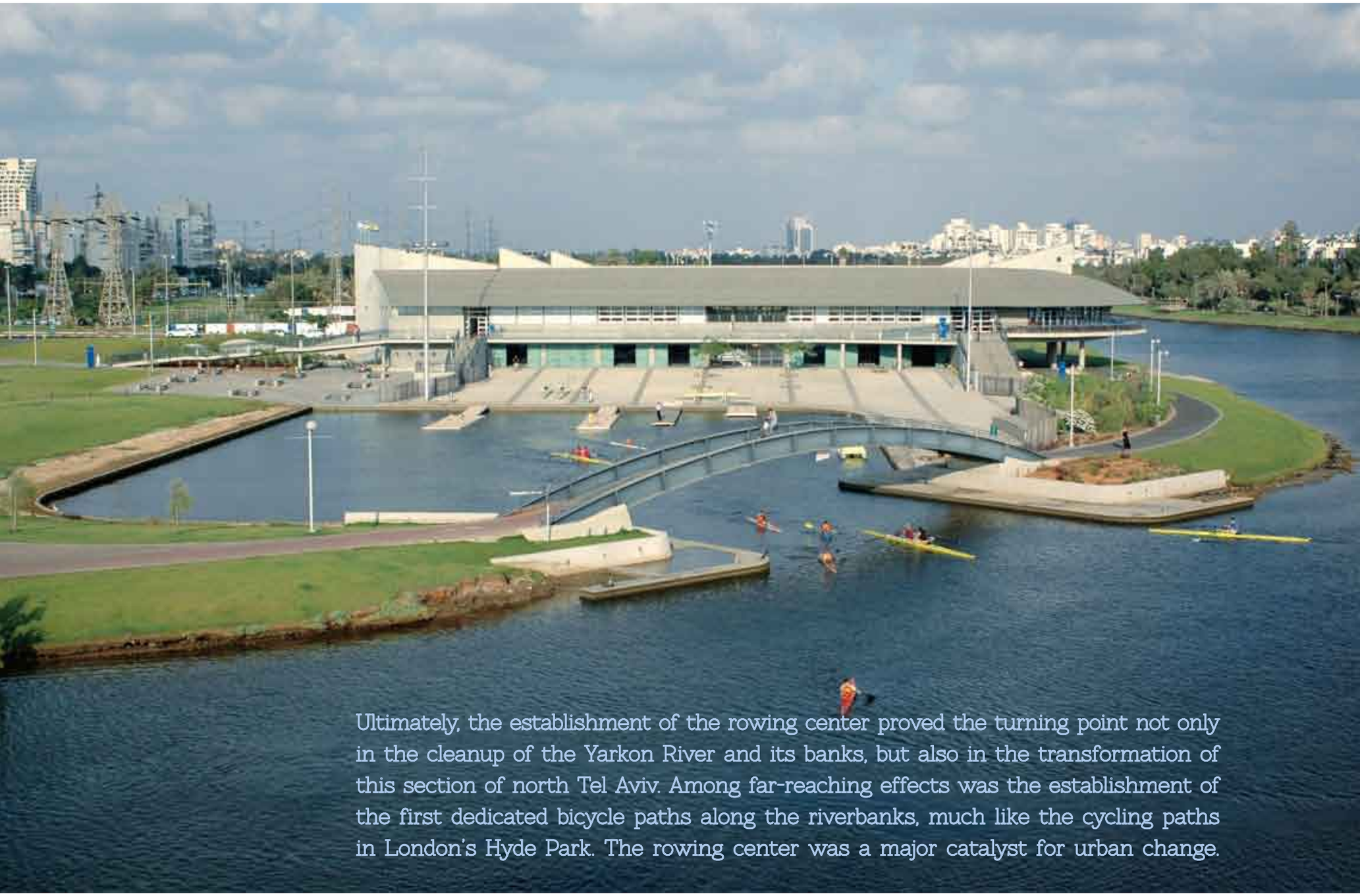
In light of their long-term collaboration, Dr. Nesher was entrusted with managing the project. "It was," says Dr. Nesher, "by no means a mere building on the banks of a river." Ultimately, its establishment proved the turning point not only in the cleanup of the Yarkon River and its banks, but also in the transformation of this section of north Tel Aviv. Among far-reaching effects was the establishment of the first dedicated bicycle paths along the riverbanks, much like the cycling paths in London's Hyde Park. The rowing center, concludes Dr. Nesher, was "a major catalyst for urban change."

The project led to a shift in mindsets as well as infrastructures. The river and its adjacent area were rejuvenated, illegal buildings were demolished, a promenade was built, municipal drainage systems were changed to prevent surface runoff from reaching the river, environmental monitoring was introduced, and the city's appearance was fundamentally altered. Recognition of the importance of cultivating and preserving open spaces for the benefit of urban dwellers and promoting wise development prevailed despite strong pressures from developers for the construction of residential and commercial projects along the northwestern part of the Yarkon.

Today the Daniel Rowing Center and its environs is one of the most beautiful areas in Tel Aviv. The process that led to this landmark achievement involved years of dedication, particularly from Dame Shirley's daughter, Linda, and granddaughter Joanna. The Rowing Center benefits people from all walks of life and brings joy to many in Tel Aviv. The Porter family is delighted with the Center but makes it clear that the vision alone was not enough; the right partners were needed to make it happen.

The Daniel Rowing Center

The project led to a change in mindsets as well as infrastructures.



Ultimately, the establishment of the rowing center proved the turning point not only in the cleanup of the Yarkon River and its banks, but also in the transformation of this section of north Tel Aviv. Among far-reaching effects was the establishment of the first dedicated bicycle paths along the riverbanks, much like the cycling paths in London's Hyde Park. The rowing center was a major catalyst for urban change.

AN ALTERNATIVE PLAN FOR THE NORTHWESTERN COAST OF TEL AVIV

Sir Leslie and Dame Shirley's move to Herzliya Pituah on Israel's Mediterranean seacoast in the early 1990s exposed Dame Shirley to the emerging discussion on coastal zone development in Israel. In a small, densely populated country characterized by rapid growth and scarce land resources, the coast offers treasured public open space. Yet, development pressures along the coastline, where most of Israel's population and industrial activity are concentrated, are especially acute.

The construction of the Herzliya marina, completed in 1992, exemplified the impact of offshore construction and motivated Dame Shirley to help protect the northern coastline of Tel Aviv. Strong opposition by Israel's environmental NGOs to a major building project along the last stretch of open coastline near Tel Aviv led to a freeze of the plan in 1998.

With the School of Architecture at Tel Aviv University, the Tel Aviv branch of the SPNI and a number of architectural students, the Porter Foundation sought to find an alternative solution. Six architectural students received grants to participate in a planning studio, conducted at the Tel Aviv offices of the SPNI, which produced models for a new conceptual plan based on a coastal park. The process is described in the doctoral dissertation of Dr. Orli Ronen-Rotem, former executive director of the Heschel Center: "The planning studio became the catalyst for the preparation of the conceptual plan for the northern coast. Without this process, supported by the Foundation, which developed the professional capacities of the non-governmental organization, it is doubtful whether the staff of the urban branch would have felt sufficiently skilled to tackle the institutional planning bodies and to propose a different conceptual direction to the prevalent development conception of urban coasts."

The decision to promote the alternative plan demonstrated the Foundation's commitment to social and environmental change. The project put coastal conservation on Israel's agenda, both on the national and local level. It empowered NGOs, such as the SPNI, to shift from reactive to proactive modes and, in the case of Tel Aviv, to become initiators of plans rather than mere opponents. It demonstrated the possibility of alternative planning by the community itself.

The concept for a coastal park was approved. However, commercial pressure for development continues to threaten this coastal strip, and Porter School students continue to be involved in the struggle to preserve the coastal park for the benefit of the public.

The decision to promote the alternative plan demonstrated the Foundation's commitment to social and environmental change.

FOCUSING ON EDUCATION: TOWARD THE PORTER SCHOOL OF ENVIRONMENTAL STUDIES

The hope of righting some of the wrongs lies in the country's youth. Education is the key in fostering a new generation of environmentally committed individuals.

Dame Shirley staunchly believes in the power of knowledge. It is not surprising, therefore, that the Foundation has advanced several educational projects in cooperation with numerous partners including the Tel Aviv Municipality, the Ministry of Education, and others. One project, known as 20/20, centered on training high school teachers to prepare students for a five point matriculation examination on the environment by introducing them to an interdisciplinary perspective based on both soft and hard sciences. Another focused on an environmental project in a junior high school in Tel Aviv chosen best school of the year by a selection committee including Tel Aviv Mayor Ron Huldai and the Ministry of Education. However, the Porter School of Environmental Studies at Tel Aviv University is, without doubt, the flagship project of the Porter Foundation in Israel.

Dame Shirley's decision to establish the environmental studies school at Tel Aviv University was only natural; her family's association with the university spans four decades. Their involvement dates back to the time of George Wise, Tel Aviv University's first president. The late **Sir Leslie Porter** was awarded an honorary doctorate from the university in 1974 for "his munificent dedication to Jewish causes in Britain alongside his wholehearted involvement with the life of Israel, and for his ardent and generous support for higher education in Israel, especially for Tel Aviv University." He went on to serve as chairman of the Board of Governors from 1985 to 1989, honorary chairman from 1989 to 1993 and chancellor of Tel Aviv University from 1993 until his passing in 2005.

With Sir Leslie, Dame Shirley, a member of the Board of Governors of Tel Aviv University in her own right, has supported the university's growth over the years, with donations including the Cohen-Porter Family Swimming Pool, the Cohen-Porter United Kingdom Building of Life Sciences, the Shirley and Leslie Porter Chair in Literary Theory and Poetics, the Porter Institute of Poetics

Dame Shirley and the late Sir Leslie Porter

"I understood that if people were made aware and educated about their environment, they would come to value and appreciate it. I believed that only by working together could we find the solutions that are vital to our survival."

and Semiotics, the Shirley and Leslie Porter School of Cultural Studies, and the Sir Leslie and Dame Shirley Porter Library Fund, in addition to a host of scholarship funds and additional projects. The example of Sir Leslie and Dame Shirley Porter has inspired younger generations of their family as well. Their children, Linda Streit and John Porter, and granddaughter Joanna Landau, are all actively involved at Tel Aviv University.

However, Dame Shirley was convinced that more needed to be done. She believed that true change would only come about with the introduction of an academic program focusing on interdisciplinary environmental studies. The idea of establishing a center dedicated to the environment in all its aspects at Tel Aviv University was a direct result of Dame Shirley's interest in cleaning, greening and beautifying the environment. She saw the environmental problems that Israel faced, took part in the struggle to protect its coastline and open spaces, recognized that knowledge and expertise about environmental issues were lacking, and, no less importantly, was appalled by the indifference she witnessed all around her.

"There was little interest in the subject in Israel at the time," she says. "But I understood that if people were made aware and educated about their environment, they would come to value and appreciate it. I believed that only by working together could we find the solutions that are vital to our survival. I wanted Israel to play its part. I also thought the Foundation could achieve the most by working with an institute of higher learning, benefiting from its unique facility for the exchange and development of ideas. If they would agree, Tel Aviv University would be our starting point." The university was receptive – and enthusiastic.

The first stage was the inauguration of the Porter Super-Center for Environmental and Ecological Studies in May 1995, with the participation of the late Prime Minister Yitzhak Rabin. A donation from the Foundation established the Super-Center, headed by Prof. Yossi Loya, a world-renowned expert on coral reef ecology who had previously served as dean of the Department of Life Sciences, at the time the only environmental body at Tel Aviv University. The Super-Center operated until 2000.

The next step was the creation of a unique interdisciplinary academic framework within a traditional university structure – the Porter School of Environmental Studies.

Dame Shirley shares a vignette about her father, Sir Jack Cohen, the founder of Tesco supermarkets in the UK, that she believes relates to her modus operandi. "He would walk into the stores and straightaway see the one dented tin on the shelf and do something about it." She has inherited that trait. "I can walk down a road, and see just the one problem in the street. My response is to do whatever can be done to fix it. It's the way I feel about our environment. Let's fix whatever is dented or better still, see it doesn't become dented!" She adds, "This country is so small, so vulnerable, so vital, so creative; one has to find ways to contribute to whatever is needed."

The hope of righting some of the wrongs, she reiterates, lies in the country's youth. Education is the key in fostering a new generation of environmentally committed individuals. She would like to help train Israel's future leaders and cultivate new agents-of-change. And she is willing to go out on a limb.

"If we believe we can help improve life on this planet, especially in Israel, it's important to try."

2 The early formation of the school

cross
bound

sing aries

"Historically, universities have generally been structured as faculties based on academic subjects, which operate like territories – in terms of budget, research, and teaching," explains Dr. Arie Nesher, the professional director of the Porter School of Environmental Studies from its very inception. "Although progress is based on excellence, competition among faculties can be a stumbling block. The question is how to cross these boundaries when new fields of knowledge emerge that do not coincide with traditional disciplines."

HOW to address environmental studies which are not an independent discipline but rather a link among several disciplines within the historic structure of the university? **HOW** to combine soft and hard sciences? **HOW** to create something new in a traditional university structure of separate disciplinary faculties?

The Porter School has been grappling with these questions for well over a decade. In fact, questions such as these were at the center of discussions when the very possibility of establishing an independent environmental school at Tel Aviv University was first raised.

To help answer some of the questions, Dr. Eilon Schwartz, founding director of the Heschel Center, introduced an expert in interdisciplinary environmental studies to the Porter Foundation – Dr. Yaakov Garb. Under a grant from the Foundation, Dr. Garb prepared a comprehensive survey on university-based environmental initiatives around the world entitled "Tel Aviv University as a Base for Environmental Change: Visions, Models, and Choices." His report, published in 1999, highlighted possibilities and models for making Tel Aviv University a center for productive engagement with Israel's environmental problems.

The findings of the study confirmed a major growth in environmental programs at university level and a growing interest in interdisciplinary study: "Many of the best environmental achievements around the world are reaching beyond disciplinary boundaries and beyond the confines of the campus; they are finding new partners, audiences, and settings for improving environmental beliefs and practices; they are focusing their research efforts onto closely related clusters of applied problems that draw on faculty expertise and demand interdisciplinary attention; and they are connecting research and teaching to policy, practice, and service in exciting new ways."

At the same time, the Garb study did not downplay the difficulties and the challenges. It noted that a "change in the way a university has traditionally done its work can pose a challenge to faculty and staff with habits and a vested interest in the academic structures that have long sustained their creative and professional achievement". It cited the conclusions of a 1999 study by Maniates and Whissel on environmental studies, titled "The Sky is not Falling," which notes that environmental studies programs "are typically understaffed, underfunded and rely on myriad faculty borrowed from disparate departments to deliver a curriculum." Even worse, such programs are characterized in the study as "parasitical on more established disciplinary programs" and therefore often doomed to failure "at the first sign of funding pressure or faculty staff movement."

However, the Garb report had an upside as well. It concluded that change would be possible if the adoption of new models is structured carefully and is anchored "in structures and commitments that ongoingly support the necessary innovations." It noted that in order for an interdisciplinary environmental program to succeed at Tel Aviv University, several elements would be necessary: obtaining the clear support of the university administration at the highest level, enlarging the pool of suitable faculty members by identifying promising young professionals and academics, adding levels of review by special interdisciplinary committees for promotion and tenure of faculty members who are doing environmental work, and assuring that funding is not merely assimilated into existing projects and departments by ensuring, among others, that the program director comes from outside the existing power structures of the university and is fully committed to forming new kinds of linkages within and beyond the university. The report concluded that "the initiative should grow through carefully phased incremental steps, each of which builds momentum, trust among collaborators, and incentives for broader partnership."

And when it comes to Israel, the report concluded that "Israel's special circumstances and pressing environmental problems point to a potentially great contribution to be made by a university-based environmental initiative – especially one built around the interdisciplinary, problem-driven, community-engaged, and policy-relevant models of research, teaching and service described in this report." The vision could only be transformed into reality with "broad and visionary guidance."

THE EMERGING SCHOOL MODEL

For **Prof. Itamar Rabinovich**, president of Tel Aviv University from 1999 to 2007, the decision to give a go-ahead to the idea presented by Dame Shirley and Dr. Nesher was natural. As a scholar in the field of Middle Eastern Studies and as former ambassador of Israel to the United States, he recognized Israel's pressing environmental problems and the growing importance of the environment both worldwide and in Israel. He was familiar with the long-time association of the Porter family with Tel Aviv University. He knew that Dame Shirley was an active member of the Board of Governors of the university. He understood, as well, that the establishment of a school of the environment would come with a significant donation. Looking back, he is proud of his part in what he calls the "joint creation of the School" and the shaping of its structure.

Economic times were hard in Israel when the School was first established in December of 2000, with the approval of then rector, Prof. Nili Cohen. The number of faculty members at Tel Aviv University plummeted from 1500 to 975. The possibility of creating a separate faculty, which would not threaten the others, did not even exist. Therefore, the model that emerged transcended existing faculties.

Prof. Dany Leviatan, who served as rector of Tel Aviv University from 2005 until 2011, recalls the difficulties of developing the academic curriculum of the School at a time of economic hardship, "without stepping on the toes of other university faculties."

"The university is a conservative body but also a developing body," he says, emphasizing that there is no way to prophesy future directions. Will the environment remain an interdisciplinary subject? Will it develop into a separate discipline? Will certain units within different faculties combine in the future? When it comes to the environment, these questions are not easy to answer since research on environmental issues cuts across traditional disciplinary

boundaries. Yet, as rector, he had to take some hard decisions. His decisions helped get the academic program of the School off the ground, led to the official recognition of the School's unique interdisciplinary graduate program, and broke down the walls between the eastern part of the campus, representing the hard sciences, and the western part, representing the soft sciences.

While the vision for the School was exciting and revolutionary, implementation was not easy because of the inherent nature of the School – its interdisciplinarity. "The university should be the melting pot of innovation, but in reality it is very conservative," says Prof. Rabinovich. "Faculties are threatened by innovation and newness and some of the university faculties viewed the new school as a threat and did not hesitate to voice their opposition to such a new entity."

The challenge was met by appointing both a professional director for the Porter School and an academic head, hailing from one of the university's faculties. Dr. Nesher, an architect and city planner with degrees from the Pratt Institute and the University of Pennsylvania, who had served as the chief architect of Project Renewal, a nation-wide project for urban neighborhood revitalization, was the natural choice for the position of professional director. Prof. Zev Levin, Prof. of Atmospheric Physics, who served as Dean of Research and Vice President of Research and Development at Tel Aviv University from 1987 to 1992, agreed to become its first academic head. As a top-tier researcher and academician, with degrees from the California State University and the University of Washington, and as the principle investigator of MEIDEX, the Mediterranean Israeli Dust Experiment on board the Space Shuttle Columbia, his scholarship, interdisciplinary understanding and collaborative skills proved invaluable in forging the initial links with each of the university's faculties. Part of his job was to convince the different faculties that the new unit, which was structurally situated under the university president and rector, would not be an institute or a center that would threaten them, but rather an entity that would help provide fellowships for their students, while working together with the faculties.

As a school with no faculty, no curriculum, and a closed budget based exclusively on donations, one of the first challenges facing the Porter School was to reach out to the nine faculties of Tel Aviv University. This meant finding members of the different faculties who were willing to teach at the School and cooperating with each faculty on environmental research projects. Such cooperation was achieved by establishing academic committees: an Academic Council, with representatives of all nine faculties, and an Executive Committee, made up of the head of the School, the professional director and two additional members representing the soft sciences and the hard sciences: Prof. Dan Rabinowitz and Prof. Avital Gasith.

A WORK IN PROGRESS: A SHORT HISTORY

Prof. Rabinovich attributes the ultimate success of the Porter School to the dedication and commitment of Dame Shirley and Dr. Nesher. And of course, he adds, each of the academic heads of the School from its inception to date has helped put the School on the map and progress it, each in his or her unique way, making it a "work in progress." "It was decided that at the beginning the academic heads of the School should come from the hard sciences because that is where the focus of power in the universities was situated," notes Dr. Nesher. The legitimacy of the School would be dependent on its association with academics and researchers of the highest caliber and impact. It was not easy to find acclaimed academics, with full and successful careers, willing to take on the extra challenge of putting the School on its feet, says Prof. Rabinovich, but Professors Zev Levin, Hagit Messer-Yaron, Yehuda (Hudi) Benayahu, Pinhas Alpert and, most recently, Dan Rabinowitz, proved to be such individuals.

The first academic head, **Prof. Zev Levin**, admits to his initial hesitancy when first approached to head the School. "The combination of hard and soft sciences under one umbrella was a double-edged sword. On the one hand, I recognized the growing importance of the environment and understood that it is a 'hot' topic that would easily attract students. On the other hand, I was worried about the potential impacts of an interdisciplinary orientation. I understood that multidisciplinarity can be a strength but also a weakness if we are not on guard," he says. While he knew that "it would be easier to jump on the environmental bandwagon from the soft sciences rather than the hard sciences," he was convinced that the School's academic reputation would best be served by a strong base of hard sciences and high levels of excellence in both teaching and research.

The seeds that were planted during his tenure, from May 2000 to June 2004, were crucial for the future development of the School: environmental courses were offered to the entire student body at Tel Aviv University, the framework for interdisciplinary graduate programs in environmental studies was established, a Porter Fellowship Program for post-doctoral students was conceived, dozens of conferences and workshops were organized, and an Environmental Justice Clinic was founded. In addition, a Memorandum of Understanding was signed with the Italian Ministry of the Environment on environmental technology research which allocated unprecedented funds – €1.5 million – to six Israeli research projects, bringing unprecedented recognition to the School in its early years.

Prof. Hagit Messer-Yaron, Prof. of Electrical Engineering at Tel Aviv University, with a PhD in Electrical Engineering from Tel Aviv University and a post-doctoral fellowship at Yale University, followed Prof. Levin as head of the School, after serving as Chief Scientist and head of the Directorate of Science at Israel's Ministry of Science. During her tenure from 2004 to 2006, she focused on obtaining academic recognition for the graduate program. It was during this period that the structural and academic pillars of the Porter School were constructed: the Academic Council and master's and doctoral committees were appointed, second and third degree graduate programs were approved by the Senate of Tel Aviv University, and the

Academic Council approved the selection of Porter Fellows in order to provide a cadre of environmental researchers and instructors at different faculties of Tel Aviv University. And, of course, research projects continued, outreach programs were initiated, and conferences and seminars were conducted.

"The formation of an Academic Council with representatives of each faculty was right politically and was right conceptually," recalls Prof. Messer-Yaron. "The different deans sent representatives of the highest caliber to the Council and they, in turn, became partners in transforming the vision of the School into a reality." The Academic Council oversees all of the academic affairs of the School and helps promote the School's academic and research activities throughout the university. "The scholars in the Academic Council," says Dr. Nesher, "have remained with us until today. They represent the environmental core of Tel Aviv University."

The challenge of the third academic head, **Prof. Yehuda (Hudi) Benayahu**, a marine biology professor who studies coral reef ecology and biodiversity of the Red and Eastern Mediterranean Seas, was to implement the programs. Prior to taking on the position of head of the School, Prof. Benayahu served as head of the Department of Zoology at Tel Aviv University and held several research posts and visiting professorships in countries throughout the world. It was during his tenure that the status of the Porter School as an independent academic unit was officially and fully recognized. Implementation of the vision was on its way in every area – a record number of students enrolled in the master's and doctoral programs and the Porter Fellows Program was advanced. At the same time, Prof. Benayahu recognized the need to integrate environmental studies into the course offerings of Tel Aviv University as a whole. With the help of a special committee, a program was developed which allowed students at the university to devote four hours a month to environmental courses as part of their bachelor degree requirements.

"I used the model of the Academic Council, which was conceived by Prof. Hagit Messer-Yaron, and opened up lines of communication and cooperation with the deans of the different faculties. This enabled us to set up academic committees, with a representative of each faculty, for all three levels of study – first, second and doctorate levels," he says. In parallel, Prof. Benayahu expanded the School's academic and research ties with universities and research institutes in Israel and abroad and laid the basis for the International MA Program in Environmental Studies, which he now heads.

By the time **Prof. Pinhas Alpert** stepped in as the fourth head of the School in October 2008, following three years as head of the Department of Geophysics and Planetary Sciences at Tel Aviv University, he could realistically say: "We are reaping the fruits of our labors with hundreds of students at every level." With his research interests focusing on atmospheric dynamics, climate and climate change, numerical weather prediction, and limited area modeling and his wide-spanning professional and academic collaboration with research organizations and professional societies worldwide, he readily speaks about his "love for research." Yet, he says, "I decided to accept the position of head of the Porter School because of

my dedication to the environmental cause, and especially the struggle against global warming. I am particularly proud of the growth of the School – in terms of the number of students, range of research topics, and implementation of new programs and initiatives: joint appointments of Porter School and other university faculty members, a non-thesis master's program, an international MA program in English, and construction of the building, which will serve as the Porter School's new home on campus."

In October 2013, **Prof. Dan Rabinowitz,** from the Department of Sociology and Anthropology at Tel Aviv University, took over as fifth head of the Porter School. As a member of the Executive Committee and Academic Council, he has been closely involved with the School since its establishment and has continually voiced his strong support for a multidisciplinary and interdisciplinary approach to environmental research.

Prof. Rabinowitz is well known in academic and public circles alike. He holds a PhD in social anthropology from Cambridge University and has published dozens of scientific articles and twelve books including the first comprehensive book in Hebrew about global warming. At Tel Aviv University, he received the rector's award for excellence in teaching and serves as chairman of the Teaching and Admissions Committee of the Faculty of Social Sciences.

In addition to his academic and research record, Prof. Rabinowitz has a rich record of voluntary work and involvement with environmental organizations in Israel and abroad which spans some thirty years. Since 2010 he has served as the chairman of the Israeli Association for Environmental Justice, and previously as the chairman of Life and Environment (the umbrella organization of environmental organizations in Israel), chairman of Greenpeace Mediterranean and vice-chairman of Greenpeace UK. In 2010 he was awarded the Pratt Foundation Prize for his unique contribution to the media coverage of environmental issues in Israel.

"The human impact on the environment is more significant today than ever before," he says. "Human beings impact on the environment at every level – individual, city, region and state. Over the past couple of decades, a growing number of hard scientists have recognized the importance of the social, political, cultural and economic contexts of their fields of research. This is especially visible among atmospheric scientists who, as citizens of the world, understand the importance of translating their findings into environmental policy. Strengthening the links between the soft and hard sciences will continue to be a top priority at the Porter School in the coming years. I believe in all my heart in the Porter School model. It is my hope that the School's move to its new green building will further advance the interdisciplinary agenda of the School, allowing it to pioneer new environmental frontiers, to impact on Israel's environmental policy, to improve production processes in industry and to promote corporate environmental responsibility."

"The combination of hard and soft sciences under one umbrella was a double-edged sword. On the one hand, I recognized the growing importance of the environment and understood that it is a 'hot' topic that would easily attract students. On the other hand, I was worried about the potential impacts of an interdisciplinary orientation. I understood that multidisciplinarity can be a strength but also a weakness if we are not on guard."

Prof. Zev Levin

"The formation of an Academic Council with representatives of each faculty was right politically and was right conceptually. The different deans sent representatives of the highest caliber to the Council and they, in turn, became partners in transforming the vision of the School into a reality."

Prof. Hagit Messer-Yaron

"I used the model of the Academic Council, which was conceived by Prof. Hagit Messer-Yaron, and opened up lines of communication and cooperation with the deans of the different faculties. This enabled us to set up academic committees, with a representative of each faculty, for all three levels of study – first, second and doctorate levels."

Prof. Yehuda (Hudi) Benayahu

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Prof. Dan Rabinowitz

THE STAFF OF THE PORTER SCHOOL

From the start, the advancement of the Porter School was facilitated by a dedicated and committed staff, each of whom has played a critical role in the shaping and daily running of the School.

Tami Singer-Limor was the first to join the School as chief administrator, playing an essential role in introducing the interdisciplinary orientation of the School into the existing university structure. Mijal Ben-Dori joined as executive projects coordinator in 2003, catalyzing and accompanying a wide range of projects in the School's early years. Soon after the inauguration of the Italian-Israeli cooperative research project in 2003, Prof. Yoav Yair was appointed to coordinate this extensive international undertaking, and by 2005, in recognition of the importance of research initiatives to the School's agenda, Yossi Karagila was appointed to promote and coordinate research proposals by Tel Aviv University researchers. In 2007, Dr. Eli Galanti took over as coordinator of both the Italian-Israeli project and as research coordinator of the Porter School.

The Porter School staff, 2014

With the School's expansion, its responsibilities have grown as well. Academic programs were implemented, outreach programs and conferences were organized, and strategic plans were drafted. Thus, when the graduate program got underway, Tami Singer-Limor took on the additional responsibility of PhD program secretary while Elia Yair joined the School as master's program secretary in 2005. Shula Goulden, with a British education and environmental studies experience, arrived in 2004 to assist in resource development and publications and was soon charged with a wide range of additional responsibilities including strategic planning and international relations. Jennifer Garr took on the position of project coordinator in charge of conferences in 2007 and later went on to plan and manage the English-language international program. Roy Kroizman joined soon after as logistics coordinator for the ever-growing number of School events and activities. Idit Nirel joined the staff in 2009 as resource developer, and then went on to replace Shula as coordinator of development and international relations. Shani Yeshurun joined in 2011 as resource developer and conference coordinator, and Dorit Landman joined the team in 2011 as secretary of the master's program without thesis. And since 2006, the smooth running of the School has been facilitated by secretaries Smadar Ivan, Maya Yakobovitz and Lina Gordon.

Throughout the years, the commitment of the staff members to one another and to the School has remained constant. Their responsibilities often intermingle as they work together toward their common goal.

THE ROLE OF DAME SHIRLEY PORTER

Combining vision and practicality, Dame Shirley, the founding donor of the Porter School, has accompanied the School along its way, providing both funding and direction at critical stages of its evolution. The success of the School may be attributed to the unique combination of funding and monitoring of the School's development at different stages – from its very establishment to the development of its interdisciplinary graduate programs and research scholarships, from the massive financial contribution toward the building to house the School to the commitment to fund joint appointments of new faculty members.

Dame Shirley says that her concern has always been with the "practical side of life," and her meticulous attention to detail has paved the way for the School's success. Determined to "stop the waste caused by duplication, lack of vision and focus," she ensures that each of the meetings which she attends proceeds according to a carefully drawn agenda in order to further the interests of the School and assure its sustainability and growth over time. At the same time, she has always refrained from dealing with the academic aspects of the School. She is convinced that young people can become agents-of-change for a better environment through education, and her concern is with the School's continued sustainability.

"The multidisciplinary nature of the School allows everyone to focus on the same issue. The enthusiasm, energy, commitment and support of everyone involved have enabled the fulfillment of the vision," says Dame Shirley. At the same time, she is acutely aware of the difficulties. "The real challenge," she says, "lies in maintaining the academic excellence and interdisciplinary orientation of the School, in promoting its links with the outside world and in preserving its spirit. This means that we must constantly ask probing questions: How best to achieve our goals? What are the alternatives? Are we doing it right?"

Dame Shirley unveiling the sign of the Porter School Building construction site, March 2011

INTERDISCIPLINARITY IN THE SERVICE OF THE ENVIRONMENT IN ISRAEL

The research study which laid the foundations for the establishment of the Porter School noted that "to be effective, an initiative must fundamentally change not only the way environmental teaching and research is done, but how the university engages with the communities and landscapes around it. The university must fit itself to grapple with problems of direct and current social relevance; to analyze issues that defy traditional academic disciplines, and that require the flexible and committed partnership of many sectors and organizations; to produce graduating students that have not only knowledge, but real world experience, and a range of new skills (in leadership, in advocacy, and in collaborative problem-solving)."

The dedicated team that has progressed the Porter School for more than a decade has set out to foster dialogue, teaching and research on the environment not only within the walls of Tel Aviv University, but outside the campus as well. This has meant removing the barriers between academia, government, NGOs, business and society at large by partnering with every sector in developing programs, conducting research, and organizing conferences, workshops and seminars on key environmental concerns.

"The intention from the beginning," recalls Prof. Zev Levin, "was to combine everything under one umbrella. We felt that we had a mission at the Porter School. We felt that teaching about the environment is important, that climate change, for example, is a critical issue. We knew it had to be done and we attracted many students from the beginning. We established ourselves as part of the milieu of the university. We were not interested in being an ivory tower but wanted to be involved in society."

The approach, outlined in the activities report of the School a full decade ago, still holds true today: "Research is the Porter School's method of finding a meaning, a reason and often an answer to significant environmental concerns. Education is the dissemination of all generated knowledge for the benefit of scholars, students, decision-makers, executives and the general public. Dialogue stands for facilitating an honest public forum on each matter. Action represents the school's community outreach initiatives and our students' value-enhancement projects."

The name, Porter School of Environmental Studies, reflects the essence of the School. The decision to use the term environmental studies rather than environmental sciences highlights the link between the soft and hard sciences. It underlines the rationale behind the Porter School – its interdisciplinarity.

3 developing the academic program

Tami Singer-Limor, chief administrator and PhD program secretary, has been part of the Porter School since its founding. In fact, she coordinated the committee charged by the rector, Prof. Nili Cohen, to review possibilities for establishing an interdisciplinary school for environmental studies at Tel Aviv University.

Tami has fond memories of the School's first quarters: four rooms and a kitchen on the ninth floor of the Faculty of Medicine, a great view, and three dedicated people: Dr. Arie Nesher, Prof. Zev Levin and Tami herself. She also remembers vividly the satisfaction of getting administrative validation for the School: its own computer number – 901. This meant that the Porter School was recognized as an independent unit within the university.

Prof. Levin, the first head of the School, recalls telling Dr. Nesher: "We have many research institutes in the university. They get money, but what they don't get is academic recognition because they don't graduate students. Our most important mission is to prove to the university that this is an academically viable program." Prof. Levin set out to use his considerable diplomatic skills to establish the necessary contacts at the different faculties that would enable the School to get off the ground.

academic recognition

MAKING ENVIRONMENTAL STUDIES ACCESSIBLE

In a School with no faculty, academic programs are not easy to develop. Therefore, with the aim of making environmental studies accessible to students throughout the university from the very beginning, two panoramic courses (non-specialist survey courses) were offered in 2001: Planning of Central Water Supply Systems in Israel and Law and the Environment. The latter, offered to students of all faculties and all degrees, remains an all time favorite.

Additional courses followed in the 2002/2003 academic year: a two-year course in Environmental Education for high-school teachers, based on a partnership between the Porter School, the School of Education at Tel Aviv University, the Ministry of Education and the Ministry of Environmental Protection, and a course titled Environmental Finance and Management, offered in cooperation with the Porter School, the Tel Aviv University Recanati Faculty of Management and the Milken Institute of California.

By 2003, some 200 students took part in a growing number of multidisciplinary courses offered by the School, including Architecture, Environment and Ecology, Environmental Ethics and Eco-Philosophy, Environment and Public Health, Urban Sustainability and Radiation Safety and Risk Assessment. The School independently offered some of the courses, including Water Resource Management, Environmental Law and Environmental Economics, others were offered in conjunction with other university faculties.

When it came to deciding on the composition of the courses, Prof. Levin was adamant in his determination to include courses in the hard sciences in a way that would attract students from across campus. In fact, one of the first courses offered in cooperation with the Department of Geophysics and Planetary Studies at the Faculty of Exact Sciences, and taught by Prof. Levin himself, was Our Environment. Its objective was to introduce non-physics students to subjects ranging from the formation of life on Earth to clouds and precipitation, from the greenhouse effect to marine pollution. "The challenge was to teach high-level classes in subjects such as physics at a level which everybody could understand," says Prof. Levin. "That meant that you had to be devoted, crazy and creative enough to teach physics to non-physics people." Prof. Levin met the challenge, and the course received rave reviews.

At the same time, Prof. Dan Rabinowitz of the Social Sciences Faculty, a member of the Executive Committee of the Porter School and the current head of the Porter School, has been an outspoken advocate of the social aspects of the environment. "What made the Porter School unique was its recognition that environmental studies must go beyond biology and the hard sciences to encompass the social sciences as well," he says. "This interdisciplinarity is at the essence of the School."

DEVELOPING THE ACADEMIC GRADUATE PROGRAM

The courses offered by the Porter School, either independently or in conjunction with other faculties and departments, proved very popular. However, the vision of the Porter School was to develop an accredited graduate degree program in interdisciplinary environmental studies.

The advancement of the Porter graduate program is most closely associated with Prof. Hagit Messer-Yaron, the second head of the School. While she had no doubt that students would flock to a school focusing on environmental studies, the question of who would teach them was another matter as the School did not have faculty members of its own. To overcome the problem, she developed a model based on a new paradigm. An academic council would be formed to strengthen the link between the nine faculties of Tel Aviv University and the Porter School, and instruction would be based on the teaching staff of these faculties.

In line with this vision, three initiatives were promoted in the early years of the School's development: a doctoral program, a thesis-based master's program, and a post-doctoral fellowship program, all of which were underway by 2006. All of the programs are based on cooperation with the nine faculties at Tel Aviv University, reflecting the School's interdisciplinary agenda. The steering committee for each of the degree programs is comprised of representatives of the faculties and is responsible for determining the program structure and admission requirements.

the courses offered by the porter school, either independently or in conjunction with other faculties and departments, proved very popular. however, the vision of the porter school was to develop an accredited graduate degree program in interdisciplinary environmental studies.

INAUGURATING THE DOCTORAL PROGRAM

Prof. Messer-Yaron, the driving force behind the initiative to develop a PhD track in the early years of the Porter School, understood that a third degree in interdisciplinary studies requires a different approach than the norm in single-discipline frameworks.

With the support of the president of Tel Aviv University, Prof. Itamar Rabinovich, the rector, Prof. Shimon Yankielowicz and the deputy rector, Prof. Israel Zang, a program was developed aimed at training students in independent environmental research in a way that reflects the multidisciplinary nature of environmental studies. Prof. Messer-Yaron was determined to break the "fear factor" of some of the faculties at Tel Aviv University who viewed the new entity as a potential threat. For one, she set out to build the trust of the faculties in order to advance the doctoral program while at the same time providing a solution to one of the difficulties encountered by graduate students in the Department of Geography and Human Environment at the Faculty of Humanities. The doctoral committee for these students, whose research studies span both the hard and soft sciences, is located in the School of History. The establishment of the doctoral committee in the Porter School, which is chaired by the head of the Porter School and includes representatives of both the hard and soft sciences, helped solve the problem of those students concentrating on the hard sciences. As a result, all Tel Aviv University doctoral students who are supervised by faculty members from the Department of Geography and Human Environment are affiliated with the Porter School as well.

The unique administrative structure of the Porter doctoral program enables doctoral students to be supervised by one or more members of different faculties while affiliated with the Porter doctoral committee. Students are encouraged to access the range of environmental research and teaching at the university, resulting in interdisciplinary research topics that are truly unique. At the same time, they are required to complete a number of courses, to participate in the Porter School's weekly seminar and to take part in the PhD Forum, a discussion group which serves as a platform in which students from all faculties meet regularly to discuss interdisciplinary research across the campus. The compulsory English scientific writing course enables the students to become part of the global environmental research community early on in their careers. And, throughout every stage of the program, they are guided by Tami Singer-Limor, whose exceptional human relations skills and administrative efficiency smooth the way toward completion of their doctorates.

Dr. Orit Skutelsky, with training in biology and ecology, was one of the first seventeen students to register for the program when registration officially opened in May 2005, following approval for the doctoral program from the Senate of Tel Aviv University on April 6, 2005. She sees the Porter School as "a cathedral for interdisciplinary research which can provide a solution to existing environmental problems." In her case, the link between agriculture and biodiversity led to an innovative research study on the sustainable management of natural resources in agricultural areas.

Dr. Amitai Or, an environmental activist, whose doctorate deals with biotechnology and microbiology, asserts that he "did not want to be buried in a laboratory, focused at the molecular level." When conducting research, he says, "you may be likened to an ant, as you concentrate on your specific field of research and never look around." Environmental research, however, is different. It requires a multifaceted outlook, which goes beyond the laboratory to the outside world, which is exactly what the Porter School PhD program provides.

Although he was at first perplexed by the idea of presenting his research to students from different disciplines at the Doctoral Forum – "How can someone from the arts critique a microbiologist like me?" – with time, he recognized the benefits of this exercise. "Someone from the outside can

students are encouraged to access the **range of environmental research and teaching** at the university, resulting in interdisciplinary research topics that are **truly unique.**

see things differently. Someone from a different discipline can provide new perspectives – asking whether the research question could be asked differently or whether different methodological tools could be used." And such a remark could be just the spark needed to create new things. "The Porter School provides a platform for ideas," he says. He recognizes that had he remained within the disciplinary framework of a specific faculty, he wouldn't have learned about environmental laws or standards. He wouldn't have had the opportunity to link academia with industry. "There is no parallel in the university," he concludes. "I am not an economist but the course on environmental economics was fascinating. I am not a lawyer but the course on environmental law was fascinating."

Tzruya Chebach, a doctoral student at the School with a rich interdisciplinary background in the natural sciences, policy and economics, is especially interested in the environmental policy and private sector nexus. "The Porter School provides a unique interdisciplinary platform for new and innovative environmental fields," she says. "Thanks to this platform I am pursuing a doctorate in environmental management under the dean of the Recanati Business School, Prof. Asher Tishler, and under Dr. Vered Blass, a true pioneer in industrial ecology in Israel. I hope that this experience will enable me to contribute to the global research on the decoupling of 'economic goods from environmental bads' and to later translate my academic work into environmental policy here in Israel."

EVOLUTION OF THE MASTER'S PROGRAM

Approval of the second degree program came a little later in the history of the Porter School. To promote graduate studies at the School, Prof. Yankielowicz, rector of Tel Aviv University at the time, established an academic committee charged with drafting the principles of the academic program. Headed by Prof. Avital Gasith, its members included Prof. Zev Levin, Prof. Juval Portugali, Prof. Amos Ullmann and Prof. Dan Rabinowitz, all of whom have remained closely connected with the School's development. The degree program which they drafted was approved by the Senate on June 9, 2004.

Although the Council for Higher Education, the official state institution responsible for accrediting higher education programs, responded favorably to the proposal, some revisions were required. The revised program was approved two years later in June 2006. However, since demand for the master's program was high from the start, registration was opened in October 2005 with 35 students under a special temporary status. Once official approval was obtained, applications exceeded the number of places available. Selection of the students was based on academic merit and equal allocation of places for students from the soft and hard sciences.

Fourteen of these students were granted their master's degrees during a landmark evening on June 13, 2010 when the Porter School hosted its first graduation ceremony for the master's program in environmental studies. One of the diplomas was presented to the family of master's student Efrat Pompas, whose research focused on incorporating green building into the sustainability discourse, but who was unable to complete her thesis due to her untimely death from cancer. An Excellence Award in Efrat's memory continues to be granted by her family to outstanding students whose research at the Porter School relates to urban sustainability, urban renewal and planning or architecture and green building.

The Porter School's first graduation ceremony, 2010

STRUCTURE AND AIM OF THE MASTER'S PROGRAM

The aim of the master's program was best expressed by Prof. Messer-Yaron in the second Newsletter of the Porter School issued in 2005: "To create and strengthen the academic foundations of multidisciplinary environmental research that will provide the human and scientific resources needed to promote environmental issues both within Israel and in international cooperation during the 21st century."

As a university-wide degree, the master's program with thesis offers students of different disciplines the opportunity to broaden their studies in the environmental field and creates a new multidisciplinary research focus with the overall goal of strengthening the academic foundations of multidisciplinary environmental work. The concept is unique: graduate students design their own individually tailored multidisciplinary curriculum, by taking both core courses in environmental studies offered by the Porter School and additional electives, recommended by their supervisors, in the relevant faculties of their studies.

The compulsory core courses serve as an introduction to environmental issues, such as environmental law, environmental economics, eco-philosophy and ecology, while the electives give students access to the full range of environmental expertise across the university, ensuring that they benefit from the input of all faculties relevant to their field of study.

Students learn about the factors driving environmental processes from the local to the global level, and are exposed to environmental technologies and advanced research methods, providing them with the knowledge and analytical skills to pursue work in fields such as environmental research, environmental education and sustainable policy-making at different levels.

The program offers students of different disciplines the opportunity to broaden their studies in the environmental field and creates a new multidisciplinary research focus with the overall goal of strengthening the academic foundations of multidisciplinary environmental work.

A LOOK AT THE COURSES

The idea for the course, first introduced in 2010, came from the students themselves who expressed a desire to be exposed to concrete environmental problems. They were eager to learn about the environment in practice, not only in theory. "In a School which thinks out of the box and does everything it can to respond to the students, it is not surprising that the School took up the challenge."

Master's degree courses are under the administrative responsibility of the Porter School and under the academic responsibility of an instruction committee (the master's committee) consisting of members of all faculties and of the supervisors. Most importantly, the studies bring together two fields of research, and are conducted under the shared guidance of two supervisors from two fields.

One of the first core courses, initiated by Prof. Messer-Yaron, was a weekly environmental seminar to encourage collaboration and exchange of information among students representing the nine Tel Aviv University faculties. Students in both the master's and doctoral programs are required to attend these weekly seminars, open to all Tel Aviv University researchers, where lectures in different fields are given by invited experts from the university as well as from other academic and research institutions, industry and government agencies.

Another course, a brainchild of Prof. Gasith, a specialist in aquatic conservation from Tel Aviv University's Zoology Department, who has headed the master's program from the start, is entitled Projects in Environmental Research. The course provides students with an opportunity to address concrete issues on Israel's public agenda. Subjects have included the conflicts surrounding the exploitation of the Ein Gedi Springs, the rehabilitation of the Kishon River, the critical condition of the Dead Sea, the preservation of open space in Israel, and other crucial environmental issues. The first semester of the course begins with a site visit, followed by lectures by leading experts in the field. In the second semester, students are asked to tackle the problem from various angles: economic, social, ecological, geological, legal, and more. Working in groups of three, they formulate research proposals and presentations on the aspects of their choice, and all papers are collected in a special course book.

Dr. Karin Ardon-Dryer, a graduate of the doctoral program, who coordinated a number of master's courses at the School, is especially enthusiastic about the program. As the coordinator of the research project course which centerd on open space, a major problem in Israel which is characterized by land scarcity, she sought to provide a multifaceted understanding of the problem, based on expert lecturers from academic, governmental and non-governmental organizations in such varied fields as planning, social justice and ecology. "The course is especially important because it teaches master's students how to write a research proposal and how to engage in scientific writing," she says.

Karin also served as a teaching assistant in an innovative field trip course offered by Dr. Eli Galanti, a former Porter Fellow whose research focused on the physics of the ocean and climate dynamics, and who served as research coordinator of the School. The idea for the course, first introduced in 2010, came from the students themselves who expressed a desire to be exposed to concrete environmental problems. They were eager to learn about the environment in practice, not only in theory. "In a School which thinks out of the box and does everything it can to respond to the students," says Karin, "it is not surprising that the School took up the challenge."

"It's a great course," continues Karin, "based on five tours that the students themselves come up with around a central theme – air pollution, waste, water, planning." And at the end of the day, the students are responsible for everything: they identify the environmental problem, organize into small groups based on their interest, arrange the tours, prepare background material and information sheets, make contacts with people in the field, invite lecturers and present summaries at the end of the semester.

Dr. Galanti also coordinated the Master's Forum where first year students gather weekly to discuss problems, such as how to find a supervisor, how to make their way within the academic bureaucracy of the university, or how to find a subject for their thesis. "It is not an easy program," says Dr. Galanti, "but the idea is to direct each student and identify the stage that each student is at in order to promote progress." Based on his own experience, he admits that it took him time to understand the value of the soft sciences. Today he recognizes the importance of understanding the social and historic processes that help shape environmental policy, alongside the findings of the hard sciences.

Learning about the environment in practice: students in the field trip course

THE CHALLENGE OF INTERDISCIPLINARITY

The driving force behind the master's program in environmental studies since its initiation is **Prof. Avital Gasith**. "The Porter School's master's program is the only one of its kind in Israel, and there are very few like it anywhere else in the world," he says. "It's an inter-faculty program, belonging to no university faculty or department in particular, and to all of them combined. Interdisciplinary research is at the heart of the Porter School."

Prof. Gasith emphasizes the special attitude of the Porter School toward its students: "Within the traditional university faculties, there is a rigid framework of what students need to study with few electives. At the Porter School, the curriculum is tailor-made to each individual – so that the student can really devote his or her time to the studies they need for their specific research and investigation." And, most importantly, the administration is there for the student at all times. "Finding supervisors for interdisciplinary research is especially difficult," says Prof. Gasith. "This is the Achilles heel for most of the students." And the problem is compounded when it comes to the hard sciences where funding is needed. Therefore, Prof. Gasith himself devotes an inordinate number of hours to personally meet with each student in order to provide invaluable information on everything ranging from the use of scientific methods to the best way to approach potential supervisors.

Elia Yair, who joined the School in September 2005 as graduate student secretary and has been responsible for overseeing the registration process and the administration of the master's program from its very beginning, concurs. "The advantages of the program are also its disadvantages," she says. The interdisciplinary nature of the study program and the requirement for two supervisors from two disciplines are serious challenges. Her job, therefore, is much more than an administrative position. Elia knows each of the students personally, helping them find supervisors, recommending courses in the different faculties, making contacts, and linking students with non-governmental organizations within the framework of an internship program which allows students to invest up to ten hours of work per week in return for a monetary remuneration.

As the representative of the Faculty of Law on the master's committee from the start, Dr. David Schorr, who served as a Porter Fellow when he took up a position in the Law Faculty in 2004, acknowledges the difficulty of integrating two disciplines in the master's program. The two supervisor structure, he says, is difficult since students must find advisors "who are willing to work with other advisors on different fields outside their comfort zone." However, he goes on to say, "This is what the degree is all about and in the final analysis the exposure is good for everyone." In fact, he says, his personal exposure to this innovative way of learning has enriched his own way of thinking when it comes to linking traditional and theoretical law with the empiricism that comes from the social sciences.

Yogev Katzir, who recently completed his master's thesis, is convinced that the program "provides the best response to the field of the environment in Israel, with an excellent staff of lecturers and subjects." He enjoyed the flexibility that the program afforded him to choose those subjects which are most relevant to him, but he recognized that the framework places a lot of responsibility on the student. "The program is not for everyone who just finished his or her undergraduate studies," he says. "Students who want to be spoon fed may be disappointed. They will not find this kind of teaching at the Porter School."

However, the advantages of the program are well worth it, says Liav Shalem, a landscape architect, who completed his first degree in Landscape Architecture at the Technion in 2007. He admits that he felt "something was missing" when he went out to work in his field. He identified the missing element as ecology and set out to find a place where he could advance in his profession while learning more about ecological systems. The Porter School second degree program provided the right opportunity. The integration of two disciplines requires a combination of self-discipline and activism, but "it makes for more professionalism."

Michal Goldberg, one of the 35 students who registered for the program prior to its official opening, readily agrees. Michal worked as a lawyer in the private sector after completing her law degree, but also felt that something was missing. "When you win a court case," she says, "only the client wins." She was looking for something more. She found it in the Porter School's master's program. It was an exciting time, she recalls. The first group of students felt that they were part of an experiment, and Michal loved the fact that students came from a variety of programs, backgrounds, ages and professions. Most importantly, the interdisciplinary curriculum served her well in her professional career, first as an attorney at the Ministry of Environmental Protection, later as legal advisor to the Knesset Internal Affairs and Environment Committee and, most recently, as the legal advisor to the Department of Environmental Health at the Ministry of Health. The course in environmental epidemiology, for example, taught her how to read a research study and understand it, giving her a major advantage when practicing environmental law and reviewing expert opinions.

By all accounts, the interdisciplinary requirements of the master's program with thesis are demanding. However, despite the difficulties, the structure of the program has opened up new directions for interdisciplinary research and innovation at Tel Aviv University.

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PORTER POST-DOCTORAL FELLOWS

Even as plans for the graduate academic programs were put on the table, the Porter School recognized the importance of creating a pool of highly qualified young faculty members that would be active in research and teaching in interdisciplinary fields, with particular emphasis on environmental law, environmental economics, environmental management and policy, epidemiology and climate change. The School therefore submitted a proposal to the university for a Porter Post-Doctoral Fellows Program in Environmental Studies that would encourage highly qualified scientists to engage in multidisciplinary environmental research and teaching in new areas in Israel in general and at Tel Aviv University in particular.

The search for suitable candidates got underway in September 2004 and attracted 55 highly qualified applicants. In the first stage, subcommittees, made up of representatives of the hard sciences and soft sciences, were appointed to assess the candidates based on academic merit. The short-listed candidates were then considered in light of the interest of the relevant university faculties in granting them tenure-track positions after their post-doctoral terms. By November 2004, the interdisciplinary evaluation committee, chaired by the head of the Porter School and including representatives of all relevant faculties and disciplines at Tel Aviv University, selected seven candidates. They took up their positions in 2005 and soon took an active part in the Porter School – teaching in the graduate program, supervising students in new environmental fields which were previously lacking, and taking part in a Fellows Forum, a monthly meeting coordinated by Dr. Nesher aimed at encouraging intellectual exchange and advancing Porter School research and projects while conducting independent research within their affiliated faculty at the university.

Dr. Hadas Mamane, who had completed a PhD program in Civil and Environmental Engineering at Duke University in the field of water research, admits that she was undecided whether to continue her post-doctoral studies in the United States or to return to Israel when she heard about the Porter Fellows Program. Today she knows that she made the right decision. Her two years as a Porter Fellow were filled with achievement: she taught, she supervised students, she raised funds for a water engineering laboratory which was partially funded by the Porter Foundation, she cooperated with different faculties and departments at Tel Aviv University, she teamed up with industrial and government institutes to work on practical water related research projects and, most importantly, she combined basic scientific principles with engineering concepts and mathematical and statistical analysis to come up with practical engineering solutions.

And what made it all possible, she says, was the financial and personal support she received from the staff at the Porter School. " The Porter School will always be a home for me," she says now that she is a tenured senior lecturer at the Faculty of Engineering, and she is dedicated to "joining worlds which would otherwise remain divided." The Porter School, she says, provided her with the opportunity to become an independent investigator, to get out of her own private little space and see what was being done just around the corner.

Her feelings are fully shared by **Dr. Dorit Kerret**, a graduate of Tel Aviv University's Faculty of Law, who continued on to a doctorate at the Department of Geography where she sought to further her interest in alternative and complementary approaches to environmental enforcement. She heard about the Porter Fellows Program during her post-doctoral studies at Harvard University's Center for Risk Analysis. As a new mother, she was ready to return to Israel, and she applied for the program.

The Porter School model provided the right opportunity, and within two years she was granted a tenure-track position at the Faculty of Social Sciences, serving "as a bridge between the Department of Public Policy and the Porter School," and establishing the Environmental Policy Clinic. She admits that an academic career was not her original intention, but she is now convinced that environmental improvement will not happen without education. "The Porter School is innovative and revolutionary – with a different approach," she says. "The Fellows Program was exceptional, making the impossible possible."

Dr. David Schorr, who embarked on his legal studies at the Hebrew University in 1996 when he moved to Israel, later completed his second and third degrees in law at Yale University. He was offered a tenure-track position at Tel Aviv University's Faculty of Law when he returned to Israel with his family and was fortunate to be accepted as a Porter Fellow at the same time. "The Porter School pulls people together, whether they come from the humanities, social sciences, art, engineering or biology. It is important to know that there is something at Tel Aviv University which is known as a School of Environmental Studies and not just individuals studying and working on environmental issues at different departments. There are immeasurable benefits to personal connections with people in other departments," says Dr. Schorr who is now a senior lecturer at the Law Faculty.

In fact, Dr. Schorr's connection with one of the Porter Fellows, Dr. Kerret, led to an important initiative. He invited her to join a unique workshop on law, policy and the environment, in which participants were exposed to lectures and drafts of academic articles on environmental law and policy from the perspective of different disciplines. Students learned about cutting-edge environmental research in a variety of disciplines and sharpened their critical and writing skills as they discussed and critiqued the articles.

Even as plans for the graduate academic programs were put on the table, the Porter School recognized the importance of creating a pool of highly qualified young faculty members that would be active in research and teaching in interdisciplinary fields, with particular emphasis on environmental law, environmental economics, environmental management and policy, epidemiology and climate change.

Dr. David Katz, who specializes in water policy and environmental economics, found out about the program while doing a PhD on environmental policy and a master's degree in economics at the University of Michigan. Invited to teach Environmental Economics at the Porter School as an adjunct lecturer in 2004, Dr. Katz developed a new course which proved a huge success. Attracting only twelve participants in its first semester, it grew into a fully-fledged course with more than fifty students, which Porter School students with no background in economics are now required to take. He fully embodied the spirit of interdisciplinarity as he taught an MBA course on Corporate Environmental Management and Strategy at the Recanati School of Management, and courses on environmental economics and environmental policy at the Porter School. "You can be an ecologist, engineer, psychologist, economist or lawyer and have a connection to the environment," he says. "I, for example, am an economist and I apply my expertise to environmental issues." Dr. Katz credits the Porter Fellows Program with giving him a firm basis for continuing the work he loves and concludes by saying: "I believe that here in Israel, we can really change things in the environmental scene. I'm definitely here to make a difference."

Today, Dr. Katz teaches graduate and undergraduate courses on water resource economics, water policy and political and economic geography at Haifa University's Department of Geography and Environmental Studies while continuing to supervise Porter School students in his fields of expertise.

By 2013, the Porter Fellowship program succeeded in attracting thirteen young researchers in new environmental fields, seven of whom have been accepted as faculty members at Tel Aviv University and another three at other universities. In 2010, an additional young and accomplished researcher, Dr. Vered Blass, began a post at the Faculty of Management based on the program's model, and is already providing a valuable asset to the School, developing the emerging field of industrial ecology, a field in which an interdisciplinary approach is critical. A four-year grant from the Marie Curie Action Reintegration Grant, which was accompanied by support from the Porter School and the Faculty of Management, enabled Dr. Blass to return to Israel after completing her graduate studies at the University of California, Santa Barbara, and to become a member of Tel Aviv University's Faculty of Management within two years of her return.

However, while Porter Fellows take part in School committees, supervise students and teach courses, their primary commitment, especially in the first phase of their academic careers, has naturally been to the faculty responsible for their academic advancement. In addition, several talented Fellows in innovative interdisciplinary environmental fields, such as environmental economics and corporate responsibility, have not received tenure-track appointments at Tel Aviv University. The School has increasingly recognized the need for faculty members of its own.

THE UNDERGRADUATE PROGRAM

Incorporating environmental components into course offerings at all of the faculties of Tel Aviv University has always been an important goal of the Porter School. Therefore, since its establishment, the School has offered a broad range of introductory environmental courses to students across the university. However, more was needed, and one of the first initiatives of Prof. Yehuda (Hudi) Benayahu, the third head of the School, was to open the environment to first degree students throughout the campus.

"Offering second and third degree diplomas goes without saying – this was clear conceptually," says Prof. Benayahu. Granting a first degree was impossible in a School without a staff to develop the curriculum. So what does one do to ensure environmental awareness in the undergraduate years? One response was to form a special committee to decide on the environmental courses that could be offered to all, without prerequisites. Another was to set out to persuade university colleagues to come on board.

Prof. Benayahu approached the deans of the different faculties, seeking to develop undergraduate environmental concentrations in partnership with them. He fostered personal contacts. Prof. Colin Price, an atmospheric scientist, who represents the Faculty of Exact Sciences on the Porter Academic Council, was among the first to voice his readiness. Prof. Yossi Leshem from the Department of Zoology had no problem in instructing art or law students with no previous background in biology. The program that emerged allowed students to choose a minimum of four monthly hours of environmental courses during their undergraduate studies anywhere on campus.

An interdisciplinary concentration in the General B.A. program at the Faculty of Humanities got underway in 2007 with the help of Prof. Shlomo Biderman, then dean of the Faculty. This concentration of courses provided a broad perspective of the environmental changes taking place in the world and their impact on human life. It emphasized the multidisciplinary tools needed to understand environmental change and to find environmental solutions.

A year later, an additional option was given to undergraduate students: a concentration of courses on environment and society offered to students at the Faculty of Social Sciences. This concentration aimed to broaden the students' knowledge on environmental issues and on the links between society, economy and the environment, with courses ranging from environmental economics to transport policy, from eco-philosophy to environmental branding.

"We saw the potential and we forged ahead," says Prof. Benayahu. High caliber students from every faculty – whether engineering, computers, physics, mathematics and the life sciences – registered for four hours of environmental courses.

The Porter School's environmental concentrations, open to undergraduate students from all faculties, have strengthened environmental teaching at the undergraduate level and exposed students from a range of different fields to environmental thinking. Although the Porter School has focused its attention on expanding its second degree programs, it has continued to enrich the undergraduate curriculum. For example, the School introduced a new panoramic course into the curriculum of Tel Aviv University in 2011. Entitled "The Sources of Israel's Creativity and Environmental Innovation in Israel," the course, which is open to undergraduate students from all faculties, is a joint venture with Kinetis, a non-profit educational organization established to promote the recognition of Israel at home and abroad as a vibrant source of creativity and innovation. The course, which has attracted some 120 students, is based on guest lecturers from a variety of disciplines in its first half and lecturers from the field of environment and sustainability in the second half. The lecturers present the latest research in their field, analyzing the incentives and impediments for environmental innovation in Israel.

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NON-THESIS MASTER'S DEGREE PROGRAM

With its master's and doctoral programs in place and with an ever-growing number of interdisciplinary research studies and teaching partnerships under its umbrella, the time had come for the Porter School to respond to a growing market need for environmental professionals. Therefore, in 2011, the Porter School inaugurated a non-thesis master's program targeted at environmental professionals and others wishing to strengthen their environmental education and training. In its very first year, the interdisciplinary program attracted sixty students of all ages, some already working in the environmental field, others interested in entering the environmental labor market for the first time.

The program is designed to fulfill the dual purpose of responding to the interest of students for a master's program without thesis and serving community and market needs. The unique blend of experienced and highly qualified lecturers and broad range of courses enables students to acquire interdisciplinary environmental education and expertise in various fields, including social sciences, humanities, management, art and law, from both a global and a local perspective. Graduates are expected to play a key role in developing environmental policies at different organizations (government, NGOs, local authorities and the private sector) and in different environmental fields, ranging from education to green building.

Three recommended tracks are available to the students. One centers on economics, environmental management and energy; the second on urban design, urban studies and sustainable building; and the third on environment, society and planning, in cooperation with the Department of Geography and Human Environment. And, in line with the Porter School's traditional emphasis on tailor-made environmental studies, students are welcome to combine all three tracks or to develop their own personal studies program. "At the Porter School," says Dorit Landman, who was especially recruited to coordinate the new program, "the door is always open. We are here to listen to each student and to respond to their needs to the best of our ability."

In addition to the course work, students are invited to seminars and workshops, many of them in conjunction with business and potential employers, exposing them to the world of the environment, both in theory and in practice. Students are also required to prepare a final project in which they investigate and analyze a concrete environmental issue, thus combining both academic research and experience in the field. Ideas for the project may come from the student, possibly in relation to his or her place of work, or from research dilemmas which are raised by industry, NGOs or government. Within the framework of the final project, the student then reviews the issue from all aspects through a literature review and interviews with experts in the field, including activists in NGOs, government representatives or industrialists. The hope is that future graduates of the program will maintain and nurture their links with the School and will bring new ideas for projects from their respective places of work, which will strengthen the links between School and community and reinforce contacts among graduates within the alumni association.

Dr. Schorr, who has served on the master's committees as the representative of the Law Faculty, is fully convinced that the non-thesis master's program has validity since "we want a good well-rounded degree in environmental management and policy so that an architect, or government planner, or lawyer or official will have the tools to understand the issue and see different approaches to solving a problem." A thesis is not needed to provide such training, and students who enroll in the program are not seeking doctoral degrees or academic advancement but rather an interdisciplinary education. That is why, says Dr. Schorr, well-qualified architects and landscape architects from such prestigious institutions as the Technion - Israel Institute of Technology opt to do their

"we want a good well-rounded degree in environmental management and policy so that an architect, or government planner, or lawyer or official will have the tools to understand the issue and see different approaches to solving a problem." A thesis is not needed to provide such training, and students who enroll in the program are not seeking doctoral degrees or academic advancement but rather **an interdisciplinary education.**

master's programs at the Porter School. His feelings are shared by other Porter Fellows. Dr. Kerret, for one, strongly believes that the second degree program without a thesis will "help create the human resources for the future so that whatever they do and wherever they will go, they will be able to spearhead an environmental agenda."

Prof. Gasith, who heads the master's programs at the School, concludes: "My motto is that you have to give back to the public," he says. "We need the Porter School because we need more educated citizens of this country who will be able to lead the country in the Knesset, the university, and the schools. Even if our students won't become professionals in their field or researchers, they will be able to contribute as teachers to municipalities, to society. It is mandatory to have an environmental school, to educate young people about the environment. Once you go through the Porter School program, you are exposed to problems and potential solutions. You can talk about issues more intelligently. This is important in order to nurture educated citizens for our future world who will know how to handle the extreme changes in our environment."

INTERNATIONAL MA PROGRAM IN ENVIRONMENTAL STUDIES

"The future of the environmental profession is both international and interdisciplinary. Environmental issues cross manmade borders between countries, as well as borders between different fields of learning," says Prof. Benayahu, academic head of the International MA Program at the Porter School. "Based on this crucial understanding, we have designed a program that equips its participants with the broad knowledge and perspectives they need to meet the complex challenges that lie ahead."

The International MA Program, initiated in the fall of 2011, offers motivated young people from around the world a double opportunity: to have a life-changing experience living in Israel for a year, and to gain skills for changing the global environment with the professional knowledge and tools acquired at the Porter School.

Jennifer Garr, who joined the Porter School in 2007 as project coordinator and who now runs the international program, credits Prof. Benayahu and Dr. Nesher with the initial idea and with the necessary drive to make it happen. An earlier attempt to inaugurate an international summer program did not materialize due to a combination of factors – a bad economy, high airfare prices and poor marketing. However, this learning experience together with developments at Tel Aviv University which saw a dramatic increase in international programs – from three to twelve – in the space of just a few years led the School to forge ahead with its plans once more. Protocols and procedures were prepared, professors were contacted, curricula were developed, and the program was finally approved in April 2010. The intensive marketing efforts which followed brought positive results. Fifteen people registered for the program, hailing from all parts of the world.

The one-year, three-semester program, taught in English on the Tel Aviv University campus, offers its international students an intensive multidisciplinary environmental program with an emphasis on Israel's unique geographic and geopolitical setting. Students tackle critical issues of policy, science and modern society; travel across Israel's unique medley of landscapes – a microcosm of the earth's climates and ecosystems – and make an impact while gaining hands-on experience, through internships in environmental policy and community projects.

The multifaceted curriculum encompasses a broad selection of environmental subjects, both core courses and a range of elective topics as diverse as environmental economics, environmental ethics, ecology, marine systems, climate change, environmental law, policy, urban sustainability, and environmental corporate management. As part of the demanding schedule of 38 credits, students are introduced to the scientific basis of the environment, mostly focusing on the hard sciences in the first semester and on environmental theory and the social sciences in the second.

Sarah Hilzinger, a Fullbright grantee from New Jersey, says she chose the Porter School due to its multidisciplinary approach: "I can take classes in environmental sciences and management, but also collaborate with the School of Government and Policy which is in the realm of my specific research," she says. **Sharon Teo** from Singapore, who has a Bachelor of Business Management from Singapore Management University, came to the Porter School to explore Israel's clean-tech sector: "Israel is a leader in clean-tech, and I believe this is the sector of the future. I would like to see more cooperation between Israel and Singapore in this field," she says.

Matthew Morrish heard about the program while volunteering in various environmental education and permaculture projects in Israel. With a background in comparative religion from the University of Washington, he moved on to an interest in history and conflicts, including environmental conflicts. The Porter School International Program piqued his interest. Some of the students, he says, opted to complement their coursework with business management classes in cooperation with the Sofaer International MBA Program and the Akirov Institute for Business and the Environment (renamed the Institute for Business, Environment and Society), but his interests lay elsewhere. While several students wanted to focus on running environmental start-ups, he was more interested in "learning how to live on the planet and interacting with this amazing system." He therefore opted for such courses as Environmental Ethics and the Effects of Globalization on Women and the Third World.

A special focus in the curriculum is the critical issue of water – a major environmental concern in Israel and the surrounding region, which has engendered advanced scientific research and innovative technologies, as well as intricate political and legal challenges. With a staff that specializes in many aspects of the water issue, the International MA Program exposes its students to the scientific, legal and policy aspects of this critical environmental issue in Israel. The program covers a wide range of topics, including marine conservation and coastal management, while also looking at water as a political, transboundary issue and exploring how understanding water as a shared resource is a key to coexistence in the region.

It was this emphasis on water issues that attracted **Monica Dean** to the program. She first became interested in Israeli water technologies while studying at California State University in Sacramento. The program exceeded her expectations. "When I registered for the courses," she says, "I had no idea who would be teaching them. It turned out that my instructors were the foremost experts in their field in Israel." Monica was the only one among the students to have a previous background in environmental studies, so she was well prepared. Yet she took more courses than ever before as part of the requirements of this intensive program.

Within the framework of their electives, students in the international program are invited to apply for an internship position with one of Israel's leading environmental organizations, industries or local authorities. Over half of the students have elected to do so, working in fields such as environmental advocacy, environmental planning, social justice, transportation, and green architecture. The internship program gives participants the opportunity to experience the inside operation of environmental organizations and authorities in Israel, to obtain professional experience, and to contribute to changes in environmental attitudes and policies in Israel. The internship experience also opens doors to employment opportunities for graduating students, in Israel and abroad.

For Monica, who was interested in Israel-Palestinian cross-cultural exchange, the internship with the Association of Environmental Justice in Israel was a highlight of her stay. The Association, founded in 2009, focuses on the interlinks between society, environment and decision-making in Israel, aiming to promote civic participation especially among minorities in Israel's periphery. Within the framework of the program, Monica joined a group of students from the Porter School who toured Jordan with Palestinian environmental activists and Jordanian counterparts as part of the "Student Forum for Regional Sustainability," a joint project of the Porter School and the Van Leer Jerusalem Institute.

The success of the international program has continued, with participants in the second year hailing from countries all over the world, including Argentina, India, Germany, Mexico, Singapore, Canada, the United States and Israel. The cross-faculty interdisciplinary program on the intersection between environment and business has elicited especially high interest from students in the 2012/2013 academic year. The business and environment concentration offers five courses, four of which are joint courses with the Recanati School of Business, taught by Dr. Vered Blass, whose expertise lies at the interface of industrial ecology and management science, focusing on decision-making and measurement of economic and environmental performance. Some 40% of the students have opted to concentrate on this innovative new field.

In recognition that many two year master's programs have an optional study abroad component in the summer between the two years, the Porter School has also decided to open its advanced summer courses to students of the environment who are looking for a unique study abroad experience. The program aims to provide students with a multidisciplinary insight into international environmental topics, with a focus on Israel's unique geographic and geopolitical setting as part of the greater Middle East region.

By all accounts, participants in the international program could not have hoped for a better coordinator than Jennifer Garr. "The first year was an incredible learning experience," Jennifer says, "both exciting and demanding." However, with the assistance of a "remarkable academic committee," she helped take the program from drawing board to reality.

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Students celebrating their graduation from the Porter School's international program

4 A platform for environmental research

collabo

A bilateral Italian-Israeli collaboration on environmental research and technology was the landmark event that accelerated the Porter School's research platform.

oration

It was an extraordinary opportunity that was made possible by a number of remarkable individuals. One was Giulio Maria Terzi di Sant'Agata, who served as the Italian Ambassador to Israel between 2002 and 2004. Another was Dr. Joyce Starr, an author and policy analyst who then served as director of Corporate Partners for the Environment at the Porter School. Yet another was Prof. Zev Levin, the first head of the Porter School.

The model positioned the Porter School within the scientific community – whether in the fields of engineering, exact sciences or life sciences. It helped develop interdisciplinary collaboration within Tel Aviv University and beyond, forging important connections with leading Italian academic and research institutions.

Meeting to promote the Italian-Israeli collaboration on environmental technologies and research, 2005:
Prof. Itamar Rabinovich, Dame Shirley Porter, Dr. Miriam (Miki) Haran (then director general of the Ministry of Environmental Protection), Dr. Corrado Clini (then director general of the Italian Ministry for Environment, Land and Sea), and Prof. Hagit Messer-Yaron.

In 2002, Dr. Starr learned of the ambassador's interest in convening an international conference on environmental technologies in Israel. Originally conceived as a conference in partnership with the Israeli Ministry of Environmental Protection, it would bring together leading Italian environmental companies and scientific institutions with innovative environmental technology groups in Israel. The importance of the convergence between scientific and industrial cooperation had already been highlighted at the World Summit on Sustainable Development convened in Johannesburg just a short while before, and both Israel and Italy recognized the value of partnerships on behalf of the environment. Dr. Starr broached the idea with Dr. Nesher, and preparations for the Italian-Israeli Forum on Environmental Technologies got underway.

Due in large part to the personal involvement of the Italian ambassador, nearly forty representatives from academia, government and industry in Italy landed in Israel in mid-October of 2002 to meet an equal number of Israeli officials, industrialists and scientists for what was to become a groundbreaking event for the Porter School. The hope invested in this unforgettable conference was best expressed by Ambassador Terzi: "This Forum," he said, "is a way to invest in the future; a way to address – from a scientific and industrial perspective – questions which are essential to the quality of life, to the basic needs of the people and therefore, in a wider concept of security and stability, also contribute to peace building." His hopes were reiterated in the keynote address by then Foreign Minister (and until recently President of the State of Israel), Shimon Peres, who spoke eloquently about "cooperation on environmental technology in the new millennium."

In light of the success of the conference, a representative of the Italian Ministry for Environment, Territory and Sea mentioned the ministry's interest in contributing some €1.5 million toward joint Italian-Israeli environmental research projects. The only question was who in Israel could administer such a project. "We didn't hesitate a minute and volunteered ourselves," recalls

With Shalom Simhon, then Israeli Minister of Environmental Protection

Prof. Levin. The School had a lot to offer: the necessary expertise, on the one hand, and the flexibility necessary to implement such a project, on the other. The unique structure of the School, its interdisciplinary focus, its capacity to administer a broad variety of fields, its ability to collaborate with a wide range of partners on different research topics and, of course, its young age and enthusiasm proved a winning combination.

On April 24, 2003, a Memorandum of Understanding was signed between the Porter School of Environmental Studies at Tel Aviv University and the Italian Ministry for Environment, Land and Sea. By November 2003, the necessary funds were granted for the initial stage of the project to identify suitable projects that address desired priorities in the environmental field.

"Agreements such as these are usually bilateral agreements between two government agencies," says Dr. Nesher. "But this was a unique agreement. Tel Aviv University signed the agreement rather than a government ministry."

The joint research agreement put the Porter School on the map as a platform for environmental research and a meeting place for environmental researchers from different disciplines. The agreement stipulated that additional stakeholders in the Mediterranean region as well as universities and relevant institutions in Israel would take part in the project. As the coordinator of the agreement, the Porter School was responsible for identifying substantive topics, experts, institutions, pilot projects and goals, all aimed at developing applied environmental technologies. The model positioned the Porter School within the scientific community – whether in the fields of engineering, exact sciences or life sciences. It helped develop interdisciplinary collaboration within Tel Aviv University and beyond, forging important connections with leading Italian academic and research institutions. And no less importantly, most of the researchers who took part in the project continued their affiliation with the Porter School, heading programs, serving on school committees, teaching courses and supervising students.

THE PROJECTS

Six interdisciplinary areas of research were identified within the framework of the agreement: urban air pollution modeling, photovoltaic applications for renewable energy in urban areas, plants for preventing desertification, artificial reefs and their interaction with the environment, remediation of polluted river sediments, and effluent treatment for river rehabilitation. At the same time, research teams, led by Tel Aviv University researchers together with Israeli and Italian experts, were set up. Some €250,000 were earmarked for each project during the one year pre-feasibility study.

By February of 2005, the expected deliverables of the different projects were presented at a bilateral workshop held at the Dead Sea, the lowest point on earth, with the participation of a wide range of stakeholders from Israel and Italy. Israel's scientific expertise and its ability to implement the projects were recognized by all, including Dr. Corrado Clini, then director general of the Italian Ministry for Environment, Land and Sea, who highlighted Italy's responsibility to the world-at-large and noted the potential of the Italian-Israeli collaboration to fulfill this goal.

Prof. Yoav Yair, who coordinated the Italian-Israeli research project, well remembers the workshop to review the progress and future of the research projects identified for the first phase of the program. The Israeli and Italian scientists who took part in the meeting not only heard about the potential scientific output of the project but were also treated to a day of touring in Jerusalem, he says. "The Italians were convinced about Israel's capabilities in the scientific realm. They saw our ability to innovate and implement. But they also formed an emotional bond to the land as they made their way to the Christian holy sites in the Old City of Jerusalem."

Remediating polluted sediment and sludge in the Kishon River

It was not surprising that a decision was made to continue the research program to a second phase, with a budget of €1.5 million, and annual meetings continued to take place in both Israel and Italy to assess progress and establish targets.

At the third meeting of the Israeli and Italian administrative and research teams, held in Rome in May 2006, Dr. Clini identified climate change in the Mediterranean basin as the key goal of new research, and another two projects were launched in 2008 which focused on this new global challenge. One centered on the

impacts of biological invasions and climate change on the biodiversity of the Mediterranean Sea; the other on harnessing the biodiversity of desert trees for mitigating the effects of climate change and desertification.

Each of the projects drew on a number of disciplines and each yielded concrete results. The project led by Prof. Amos Ullmann, for example, was based on engineering and biology to remediate the polluted sediment and sludge in the Kishon River; the modeling system for urban air pollution, a project led by Prof. Pinhas Alpert, was tested both in the Israeli coastal city of Ashdod and in the Italian city of Brindisi; and Prof. Avital Gasith's project on polishing municipal secondary effluent for stream rehabilitation saw the establishment of constructed wetlands in the Shafdan, the wastewater treatment and reclamation plant of the Tel Aviv metropolitan area.

The project, led by **Prof. Avi Kribus** of the Faculty of Engineering, a member both of the Academic Council and the master's committee of the School, merged research and technology as it focused on the use of photovoltaic cells as a renewable energy source. Known as BISC (Building Integrated Spherical Collectors), the project demonstrated the ability to construct building scale concentrating photovoltaic cells within just two years. Its merits and potential were subsequently recognized by the European Commission, within the framework of the Framework Program for Research and Technological Development.

Similarly, internationally acclaimed results were obtained from the study on the impacts of biological invasions and climate change on the biodiversity of the Mediterranean Sea. The research project, led by Prof. Menachem Goren, showed that the future is already here. Looking at data collected in the eastern Mediterranean, in Israel and Turkey, and comparing the findings with Italy, showed a major rise in alien species that clearly correlated with higher temperatures. In fact, it demonstrated that invasive species were already more prevalent than indigenous species in some areas.

Climate change also featured in a project, led by Prof. Amram Eshel and the late Prof. Yoav Waisel, on the identification of plants that could be used to prevent desertification.

The researchers based their study on the tamarix, a tree indigenous to old world deserts. They transported 150 different varieties of the tree from the Dead Sea area to Yotvata in the Arava desert, just north of Israel's southernmost city of Eilat, then set out to use low quality recycled sewage and saltwater to grow the tamarix. Amazingly, the trees adapted quickly to the weather, salinity and water stress of their new home. And just as amazingly, Prof. Waisel, who had retired from the university years before, joined Prof. Eshel several times a month to visit their study plot in the midst of the desert. The two rose at dawn and drove five hours to Yotvata where they conducted their research before returning to Tel Aviv at night. They investigated the adaptation of the plants to salinity and water stress in a desert environment and their potential for carbon sequestration. The results convinced them that the project could be replicated in other arid regions throughout the world, including in areas where barren land is plentiful, such as the Sahara, parts of India and Central Asia. Moreover, the trees could one day be used as a biomass crop for making biofuel, thus reducing the world's dependence on fossil fuel.

Yet another research study on the tamarix was approved in 2008 within the framework of a project led by Prof. Aviah Zilberstein; this involved harnessing the biodiversity of desert trees for mitigating the effects of climate change and desertification. The newer study used molecular biology methods to examine the genetic mechanisms that enable particular species to survive under extreme desert conditions. The findings could be used in the future to identify genotypes for various uses in arid and saline regions and to combat desertification by improving the resilience of plants through genetic engineering.

REMINISCENCES OF AN EXCEPTIONAL PROJECT

If there is one thing that evokes superlatives and smiles from everyone associated with the Porter School it is the Italian-Israeli research project. The ties forged with Dr. Corrado Clini led to a unique research agreement that bore bountiful fruit. The funds invested led to practical projects and concrete results that could be implemented in the field – whether solar collectors for renewable energy or river rehabilitation.

Prof. Yoav Yair, past dean of Development and Learning Technologies at the Open University of Israel and chairman of MEITAL, the Inter-University Center for e-Learning, says he learned a lesson on "how to run big science" while coordinating the Italian-Israeli research project between 2004-2007. Beginning as a student of Prof. Levin at the Department of Geophysics and Planetary Sciences of Tel Aviv University and then collaborating with him on the MEIDEX project on the Columbia space shuttle, he credits Prof. Levin with teaching him how to be "both a scientist and a manager."

When invited by Prof. Levin to take on the coordination of the project, Prof. Yair met the six chief investigators. He was familiar with the work of only one – Prof. Pinhas Alpert. The other projects were previously unknown to him and introduced him "to a whole new world of knowledge."

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The Italian-Israeli project was all about innovation and breakthroughs "and this is what I loved," says Prof. Yair. He gives full credit to Prof. Zev Levin, Dr. Arie Nesher and Dr. Corrado Clini for the success of the project. It was a success built of professionalism and camaraderie. The researchers were carefully chosen and the results presented to all stakeholders – from Israel's Ministry of Environmental Protection to the Knesset Science Committee. In fact, when Prof. Benayahu presented the artificial reef project to the Science Committee of the Knesset in 2006, he managed to captivate the non-scientific audience with the findings of a scientific study involving both Israeli and Italian academic and scientific institutions. The breathtaking pictures of biological activity on the artificial structures fascinated the parliamentarians. The results of the research were thus made accessible to the country's decision-makers, fulfilling one of the central objectives of the Porter School.

Coordination of the complex project proved challenging but doable, thanks, in large part, to the administrative skills Prof. Yair learned from Prof. Levin while working on the NASA project. The funds allocated to each project were "immense on an Israeli scale and enabled all six investigators to handpick the best people to conduct field experiments and come up with concrete and applicable results."

At the same time, the relations forged with the Italian counterparts were warm and friendly. Prof. Yair recalls that Dame Shirley accompanied him, Prof. Benayahu and Prof. Yaakov Mamane of the Technion to one of the meetings in Rome to further the urban air quality project. "It was typical of her to ask to come along to see that everything was done as it should be," says Prof. Yair.

Dr. Eli Galanti, who took over the coordination of the Italian-Israeli research project, sums up the experience: "The agreement was totally exceptional. There was nothing like it either before or after. We absolutely delivered the goods. The research led to technological developments, which is what the Italians wanted. The project was a gigantic success and the Porter School became synonymous with this success story."

Between 2003 and 2010, €6.5 million were invested in the project. Although ideas for new projects in areas of interest to the Italians – green building, sustainable development or renewable energy – were forwarded in later years, fewer projects were approved in the second phase. The global economic crisis of 2008 and the change of administration in the Italian government did not allow the continuation of a bilateral agreement between a government ministry and a university. In 2010, a decision was made to convert the Italian-Israeli collaboration into a formal bilateral agreement of cooperation between the Israel Ministry of Environmental Protection and the Italian Ministry for Environment, Territory and Sea.

PROMOTING RESEARCH

Throughout its existence, the Porter School has attempted to be, in the words of Prof. Messer-Yaron, "a facilitator of research on the environment." As demonstrated by the Italian-Israeli project, the School's structure enables it to serve as a platform for novel, interdisciplinary research, based on the view that solutions to environmental problems rely on a range of fields and benefit from the insights of more than one discipline.

As stressed by Prof. Hudi Benayahu, "The School model is based on cooperation." This means that the School brings together researchers from a range of fields in unique collaborations, finances research projects where possible, and assists researchers to submit environmental proposals to national and international calls for research. Links with research institutions in both Israel and abroad are central to this model, both when submitting funding proposals and when searching for the most appropriate experts to supervise master's and doctoral students in their interdisciplinary theses.

Additionally, the Porter School makes research funds available to both faculty and students for multidisciplinary environmental research projects within Tel Aviv University to cover projects as far ranging as plant invasion in the face of global climate change to high-performance wind turbines to the effects of Pollutant Release and Transfer Registers (PRTRs) on environmental awareness and industrial emissions. Some of the studies have proved pivotal in promoting government policy on the environment. For example, comparative studies conducted by former Porter Fellow Dr. Dorit Kerret and her students on PRTRs have facilitated the enactment of a recent law on the obligation of industry to report its pollutant emissions and waste transfers, thereby increasing environmental transparency in Israel.

In another area, former Porter Fellow Dr. Hadas Mamane is helping to make a real difference in the development of innovative technologies to improve water quality in Israel. The research she conducts in the Water Treatment Laboratory of the School of Mechanical Engineering, which is partly supported by the Porter School, has yielded groundbreaking work on different processes of water treatment, ultraviolet and solar disinfection and biofouling control. "The research", says Dr. Mamane, "is totally multidisciplinary. It requires the cooperation of a wide range of disciplines and experts from a large number of departments – electrical engineering, chemistry, solar energy, microbiology, physics, optics, ecology and more. It combines applied and basic science and it takes place both in the university lab and in the field, in cooperation with industry and government authorities."

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A CASE OF INTERDISCIPLINARY RESEARCH: LINKING ENGINEERING AND ATMOSPHERIC SCIENCES

Dr. Eli Galanti, a former Porter Fellow who served as research coordinator at the Porter School, believes that research is its own reward. Yet, at the same time, he says, "When we do our research to the very best of our ability, it will also contribute to someone else. The contribution of the School lies in the very existence of interdisciplinary research." The connections between disciplines and between people cause people to talk to one another, sparking creative new ideas.

The groundbreaking research conducted by **Dr. Artem Zinevich** is a case in point. The research was born of a conversation between two professors: Prof. Messer-Yaron from the Faculty of Engineering, head of the Porter School between 2004 and 2006, and Prof. Pinhas Alpert, then head of the Department of Geophysics and Planetary Studies, who served as the head of the School between 2008 and 2013, both of whom later became his supervisors. In recognition of the importance of reinforcing interdisciplinary research connections within Tel Aviv University, Prof. Messer-Yaron initiated visits to laboratories of university researchers who were collaborating on projects with the Porter School. It was at such a visit that she and Prof. Alpert discussed the current challenges in their research, a discussion that ultimately led to a pioneering project that was published in *Science*, the premier journal of scientific findings. Artem, who had just approached Prof. Messer-Yaron about the possibility of studying electrical engineering, proved just the candidate to undertake the research that led to the discovery.

"The initial idea came from Prof. Messer-Yaron," he recalls. "Knowing that radio signals transmitted by cellular stations are affected by atmospheric conditions, she discussed possible implications and applications of this phenomenon with Prof. Pinhas Alpert. Together they proposed that I, a geophysicist, should look into it, and I gladly accepted the challenge. I understood that the study of weather through cellular networks was a promising new direction. So essentially, this project is a wonderful example of multidisciplinary collaboration at the Porter School. The doctoral subject would never have come about without the Porter School."

Artem began by focusing on the effects of rainfall on the high frequency microwave radio transmissions used for communication between cellular base-stations. "Cellular operators monitor these transmissions over long periods of time, so we had an excellent database to work from. The network exists. The data is there. We just found an important new use for it – at practically no extra cost. That's why this is such a great idea!" he says.

When Artem presented his initial findings, Prof. Messer-Yaron reacted with one word – "Wow." By 2006, an article on "Environmental Monitoring by Wireless Communication Networks" was accepted for publication in *Science*, followed by additional presentations of his original work in peer-reviewed scientific journals and international conferences. By 2010, Artem published his pioneering dissertation on "Spatio-Temporal Monitoring of Precipitation by Microwave Networks" which focused on the development of algorithms and interpretation strategies that are applicable for essential precipitation measurement problems.

The Porter School provided Artem not just with out-of-the-box-thinking, but with the cooperation and funding needed to advance his research: statistical data from Prof. Zev Levin, contacts with Israel's cellular companies through

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Prof. Messer-Yaron, meetings and forums with all stakeholders including the cellular industry, and opportunities to meet with researchers all over the world through international conferences. "From a scientific viewpoint, the Porter School allowed me to borrow the models and scientific tools from engineering, to apply them to the precipitation sensing issues, and to share them with the hydrometeorological society via publications in relevant magazines and conference presentations."

Based on Artem's research, and aided by additional data from Israel's cellular companies, several other graduate students from Tel Aviv University's Geophysics and Engineering Departments expanded the project in new directions. Together, the multidisciplinary group obtained a research grant from the Israel Science Foundation, and co-founded PROCEMA (regional PRecipitation Observation by CEllular network Microwave Attenuation and Application to Water Resource Management) – a joint Virtual Institute, funded by the Helmholtz Association. Under this umbrella, the Tel Aviv University researchers joined forces with several leading institutions, including the Institute for Meteorology and Climate Research, the Technical University of Munich, Israel Oceanographic and Limnological Research Ltd., the German Weather Service, the University of Applied Science at Regensburg, and Ericsson Transmission Germany.

PIONEERING NEW DIRECTIONS IN STUDENT RESEARCH

Passion for interdisciplinary research is at the very heart of the Porter School. The wide range of research studies conducted by Porter students at the master's and doctoral levels is pioneering new directions for environmental betterment.

Examples are plentiful. **Avi Luvchik**'s master's thesis, for instance, set out to validate a numerical model for forecasting concentrations of sea salt aerosols, which was previously developed at Tel Aviv University. "The scientific community is keen to measure the concentration of these aerosols in order, among other things, to more accurately predict rainfall quantities," he explains. His research, under the supervision of Prof. Alpert and Dr. Pavel Kishcha at

Tel Aviv University and Prof. Yehuda Agnon of the Technion - Israel Institute of Technology, was based on actual measurements in five different locations encircling the entire Mediterranean, and he found "a high correlation between the model's forecasts and the real measured concentrations." Following the successful project, Avi applied for the Alan Howard Scholarship in the Energy Futures Lab, in cooperation with the Centre of Environmental Policy (CEP) – which enables outstanding Israeli students to conduct their PhD research at London's Imperial College. His application was approved and he completed his doctoral thesis under the supervision of Dr. Judith A. Cherni of the CEP and Dr. Panos Parpes of the Computer Science Department at Imperial College. "My previous experience led me, with Prof. Alpert's guidance, to a challenging new idea," he says. "Together we propose using atmospheric parameters to determine optimal locations for solar energy photovoltaic (PV) systems in Israel. This is a new approach that can considerably increase the energy efficiency of these PV systems. I hope and believe that studies like mine will provide policy-makers with a sound foundation for making informed decisions."

Similarly, while doing her doctorate at the Porter School, **Dr. Karin Ardon-Dryer** centered her research on the influence of air pollution on cloud formation and precipitation quantity. She attests to the fact that she always had a passion for "finding out why things happen." However, when Prof. Zev Levin suggested the study of ice nuclei, "the subject was like Chinese to me."

Before long, however, the particles that act as the nucleus for the formation of an ice crystal in the atmosphere became her new passion. "Today people tell me my eyes shine when I speak about ice nuclei," she says.

In another area, the Israeli Ministry of Energy and Water Resources awarded MA student Elad Shochat a scholarship for his interdisciplinary research in the field of energy. Under the supervision of Dr. Moshe Givoni of the Humanities Faculty at Tel Aviv University and Dr. David Katz of the Social Sciences Faculty at Haifa University, Elad is concentrating his research on the use of green technologies in transportation, with a unique focus on social aspects, and is asking such questions as: how will the introduction of green technologies affect people's travel habits or influence government decisions regarding public rather than private transportation. The answers may have major implications on the future use of these technologies and related policy-making.

Another research study that may help influence government policy is being conducted by PhD student Doron Schults and supervised by Prof. Benayahu of the Faculty of Life Sciences at Tel Aviv University and Prof. Aliza Fleischer of the Hebrew University Faculty of Agriculture. As a recreational diver and underwater fisherman, Doron was interested in researching the ecological and economic effects of recreational fishing along the Israeli Mediterranean coast, an area not investigated previously. His background led him to study the topic from an economic viewpoint as well, in order to create a model for regulating the sport so as to decrease its ecological impacts, while recognizing the needs of those engaging in the sport.

Asaf Sagi, who recently completed his master's thesis on the resistance of bacteria to antibiotics in treated wastewater, says that this subject is especially important because "in Israel treated water is reused for agricultural irrigation and river rehabilitation – which means we may find the resistant bacteria back on our plates." To the best of his knowledge, "This study is the first in the world to combine and compare measurements of wastewater bacteria with those of antibiotic contaminants." Therefore, his research, under the supervision of Dr. Dror Avisar of the Faculty of Humanities and Prof. Daniel Cohen of the Faculty of Medicine at Tel Aviv University, may launch an entirely new direction for future research, requiring scientists to come up with new procedures to counter this phenomenon in Israel's wastewater treatment plants.

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Master's student Orna Schweitzer has focused her research on green roofs and their ability to reduce a building's energy consumption.

PhD student Elad Persov is focusing on the role of a design manager in the process of developing more sustainable products.

In yet another field, the research conducted by PhD student **Yael Helfman Cohen**, under the supervision of Prof. Yoram Reich of the Faculty of Engineering at Tel Aviv University, aims to uncover the principles or patterns underlying natural phenomena and to present them in a way that will allow engineers to make use of these principles in designing future innovative and sustainable products. The method she is developing will respond to the two main challenges of biomimetic design: How to find the right biological phenomenon for inspiration or imitation and how to analyze the biological model in order to use it successfully in a given engineering context.

Other students are focusing their research on ways to improve both quality of life and the environment in Israel. Master's student Orna Schweitzer, for example, focused her research on green roofs and their ability to reduce a building's energy consumption, under the supervision of (the late) Prof. Yoav Waisel of the Faculty of Life Science at Tel Aviv University and Prof. Evyatar Erell of Ben-Gurion University of the Negev. While this topic has been widely studied worldwide, Orna checked whether this solution is suitable to Israel's unique environmental conditions and, if so, which plants would best be suited for use on green roofs in Israel. Her findings have not only demonstrated the suitability of green-roofed buildings in Israel but also identified the plants most appropriate to use – both in terms of cooling potential and of water consumption and labor intensity.

Gilad Ronnen's PhD thesis, supervised by Prof. Juval Portugali of the Faculty of Humanities at Tel Aviv University, aims to "locate users of city edge landscapes, to observe their experiences and to examine how these experiences relate to the spatial opportunities afforded by these landscapes." After studying urban landscape planning in a laboratory at Kyoto University, he says that he was transformed "from a landscape architect to a landscape researcher." He was curious about the meeting between city and open nature in Israel and is investigating the visual perception of landscape in Tel Aviv, looking at how people experience and use endangered landscapes. "There is a lot of ecological analysis of landscapes," he says, but his interest lies in pursuing a new direction - "ecological psychology."

In yet another area, sustainable design management, PhD student Elad Persov, is focusing on the role of a design manager in the process of developing more sustainable products, under the supervision of Dr. Edina Meyer-Maril of the Faculty of Arts at Tel Aviv University. The multidisciplinary emphasis of the Porter School, he says, exposed him to new methodologies that are enabling him to quantify the sustainability level of new products.

CONFRONTING THE CHALLENGE OF INTERDISCIPLINARY RESEARCH

"The students who opt for the Porter School are often more innovative than the institution and the researchers," says Dr. Nesher. "This is what makes the School so special." The traditional university structure, organized around faculties is "not always ready for interdisciplinary forms of thinking."

According to Dr. Nesher, "The field of environmental studies is gaining momentum and deriving its strength from the students themselves, from the young adults who choose to enter the field. They are the strength of the School." To meet the needs of these students, the Porter School has dedicated itself to tailoring a special track of study based on each student's research idea. The connection between supervisors equipped with theoretical knowledge and students ripe with new ideas and applications is what facilitates the emergence of innovative new directions in interdisciplinary research, which often integrate the hard and soft sciences.

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5 outreach through conferences


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Environmental problems span a wide range of disciplines, encompass competing interests and defy easy solutions. Therefore, dialogue on pressing environmental issues that reaches beyond the walls of academia has always been a central tenet of the Porter School philosophy.

Since its very beginnings, the School has determined to emerge from the ivory tower of academia by opening up key environmental issues at the top of the national and international agenda for discussion in conferences, workshops and seminars. The focus has nearly always been on research that could then be translated into decision-making for a sustainable environment. Therefore, the School partnered with leading environmental organizations to promote environmental discourse among all sectors of society – government, industry, academia and the third sector, especially environmental non-governmental organizations (NGOs).

The decision to forge close partnerships with Israel's NGOs proved vital in light of the key role played by these organizations, as the representatives of the public, in promoting environmental discourse at all levels.

"During the first five years of our existence, conferences were our main activity, and they identified, examined, and exposed crucial environmental issues," recalls Dr. Nesher. "We didn't have the necessary academic approvals for our second and third degree programs yet, which only came through in 2005, so conferences were our way to put the Porter School on the map." Dr. Nesher, together with Tami Singer-Limor, lost no time in convening the first conference just a month after the Porter School was founded.

In the formative years of the Porter School, initial funds for the conferences came from the Kahn Family Foundation, while the organizational and marketing skills came from Mijal Ben-Dori, hired in 2002 to fill the position of executive projects coordinator. With a master's degree in media and communications from the London School of Economics and Political Science along with the dedication and creativity necessary to make things happen, Mijal proved the perfect candidate for the demanding job.

"The strength of the conferences," says Mijal, "was based on taking the environment from something associated with green freaks and giving it an academic and practical basis. I tried to open the subject to people from all sectors and all realms." This meant initiating conferences, symposia, workshops, roundtables and guest lectures on subjects as diverse as sustainable architecture, transportation, green chemistry, renewable energy, health and the environment, river rehabilitation and nanotechnology. The basis of each of the conferences was always multidisciplinary, highlighting the academic, social, economic, environmental and public aspects of the subject. The focus was always on innovation, and the goal was to raise environmental awareness, promote discourse and help shape environmental policy in Israel.

DISSEMINATING ENVIRONMENTAL DISCOURSE AND CONCEPTS

In its first year, with less than a handful of staff members, the Porter School held seven conferences on pressing environmental issues. The rationale behind the organization of half a dozen events per year in its early years and sometimes double this number in subsequent years was the School's commitment to making the environment accessible to stakeholders across the board, on the one hand, and its determination to position itself as a central academic platform for environmental discussion leading to action, on the other.

Many of the themes discussed in the initial conferences – water, pollution, planning and transportation – continued to be featured, with variations, in subsequent years. Others were added to respond to emerging new issues on the global and national agenda – climate change, renewable energy, health and the environment, biodiversity and environmental economics, to name but a few.

Jennifer Garr, who replaced Mijal as coordinator of conferences, views the conferences as "the face of the School." With a background in both environmental science and education, she was especially attracted by the goal of the conferences: "Opening up new environmental topics and educating the public in a free and open way." She found "the scope of topics covered in the conferences to be incredible – ranging from green chemistry to peace parks to eco-criticism to environmental policy and everything in between."

Conference topics, in fact, range from timely legal issues such as environmental transparency in the wake of the Freedom of Information Law, with a keynote address by Att. Jane B. Stewart, director of the International Environmental Legal Assistance Program at New York University, to down-to-earth issues that affect millions of Israelis daily such as parking problems in Tel Aviv, featuring a parking model developed by Prof. Itzhak Benenson of the Department of Geography and Human Environment at Tel Aviv University.

Nearly all of the conferences highlight the links between disciplines – looking at the interconnections between environment, economy and society, the relations between the arts and the environment, or the science and policy interface of health and the environment. And the wide breadth of topics is matched by the diversity of organizations and institutions that partner with the School to make the conferences a reality.

A look at the more than 120 conferences and roundtables held at the Porter School from 2001 to 2013 mirrors the environmental developments that have been at the forefront of both the global and national agenda since the founding of the School.

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INTEGRATING ENVIRONMENT AND DEVELOPMENT

In a small and densely populated country such as Israel, characterized by rapid population growth and economic development, the tension between development and conservation is ever present. Therefore, it is not surprising that many of the conferences convened by the Porter School have addressed the challenge of how best to balance Israel's vital development needs with the equally vital needs of the environment.

The School's first conference came in response to Israel's decision to pave a major highway to connect the north and south of the country. Supporters of the project claimed that construction of the Trans-Israel Highway would help solve congestion problems, improve access to remote areas and allow for efficient connection between the northern and southern regions of Israel. Opponents of the project, for the most part environmentalists, countered that the highway would lead to increased pollution, disappearance of open spaces, advancement of urban sprawl, and diversion of funds urgently needed to promote public transportation. In view of the public debate and the campaign launched by environmentalists against the project, the fledgling School decided to organize its first public conference in January 2001 around this issue.

A second conference on the risk of groundwater pollution from highway runoff followed a few months later in March 2001. Significantly, this second conference, hosting American experts on the problem of highway runoff, was covered by the media and featured on the front page of Israel's daily *Ha'aretz*. The conference and the publicity surrounding it catalyzed important changes in Israel's road planning standards and policy. The Porter School achieved its goals: it exposed an environmental problem, presented expert opinions from both Israel and abroad on the issue, promoted dialogue among stakeholders and helped advance an environmentally sound solution.

Many of the conferences in the School's first years focused on the environmental costs of accelerated development. One such conference discussed the future development of an especially desirable but polluted site in the Tel Aviv region that formerly served the Israeli Military Industries. Surveys conducted at the site demonstrated both soil and groundwater contamination, with major implications on the future use of the land for residential development, which were discussed in the Prime Minister's Office. Important questions had to be answered: What were the remediation requirements for the site? How could planning proceed in an area plagued

by pollution? Should the polluter pays principle be implemented? What were the legal repercussions? These and other questions stood at the center of a May 2001 conference on the scientific, legal and planning aspects of soil and water pollution in the Tel Aviv metropolitan area. The conference and its recommendations reached municipalities and the Ministry of Environmental Protection, as well as the Prime Minister's Office.

ADDRESSING WATER SCARCITY AND POLLUTION

Water scarcity, a problem Israel has had to contend with from its very establishment, also figured high on the initial list of conferences. A conference organized in June 2001, in cooperation with the Nature and Parks Authority, the Israel Water Association, the Ministry of Environmental Protection, the Society for the Protection of Nature and the Institute for Nature Conservation Research at Tel Aviv University, brought together representatives of Israel's major water organizations to seek solutions to the question of how best to allocate Israel's scarce water resources among consumers, one of which was nature itself.

Another conference, convened a few months later, in cooperation with the Israel Water Association, the Israel Export Institute and EcoForum – the Israel Economic Forum on the Environment, focused on the water issue from the point of view of supply and demand. It brought representatives of the legislative and executive branches of government together with professionals, academics and legal experts to look at government policy and at the tools used to manage Israel's scarce water resources. A special exhibition accompanied the conference to showcase new technologies that can provide a solution to the water scarcity problem.

Other aspects of the water problem were discussed in subsequent years. For example, a symposium organized by the Porter School together with Friends of the Earth Middle East in December 2003 looked at means of protecting the mountain aquifer. The goal of the symposium was to raise awareness of pollution threats to the aquifer and to develop a unified approach by local, national and international organizations to address the sources of pollution and recommend strategies to improve the local sewage infrastructure. Israel's Minister of National Infrastructure delivered the keynote lecture and attendees included representatives from Israel, the United States and Germany, as well as researchers and local environmental organizations. With both national and international media coverage, the recommendations of the symposium reached both the public and decision-makers.

Similarly, the pollution of one of Israel's major rivers, the Kishon, was the subject of a conference organized by the Porter School and the Institute for Nature Conservation Research at Tel Aviv University in May 2004. It looked at the past, present and future of the Kishon River, and explored rehabilitation options, scientific methods for pollution

assessment and public policies. Prof. Peter Zlonicky from the Emsher Park program in Germany delivered the keynote address on "River Rehabilitation: the International Experience," while leading academic and government experts presented the scientific, ecological, legal, planning and economic factors affecting the river's management. The conference led to a heated debate between local stakeholders including NGOs and representatives of local fishermen and naval divers who trained in the Kishon River and representatives of local and national government. It also raised the awareness of local authority and government officials of the environmental and health problems caused by the pollution and presented them with some of the latest research findings on river rehabilitation.

INNOVATIONS ON BEHALF OF THE ENVIRONMENT

Innovation has always been a central element in Porter School conferences – whether innovative technologies relating to energy or water management, or innovative fields such as nanotechnology and biotechnology. In recognition, for example, of the potential contribution of the new field of green chemistry to Israel's industrial and academic development, on the one hand, and to the health of people and the environment, on the other, the Porter School initiated Israel's first conference on "Green Chemistry – Applications, Research and Trends" in June 2007. Green chemistry was a relatively obscure subject at the time, both in academia and in industry. Therefore, the main aim of the conference was to "introduce academia, industry, government and NGOs in the region to the field – among others, via introducing novel research and trends from abroad, and for the conference to serve as a starting point for numerous other activities involving industrial associations, government and academia, to bring forward a more sustainable agenda for chemical R&D in the region." The conference featured presentations from experts the world over, including Prof. Yoel Sasson of the Casali Institute of Applied Chemistry at the Hebrew University of Jerusalem who served on the steering committee of the conference. It showcased breakthrough technologies in green chemistry that could be targeted at some of the environmental challenges facing Israel.

While green chemistry was a relatively unknown field in Israel, this was not the case with nanotechnology, an emerging "hot" field that enjoyed ample research funds and won government recognition as a priority field. At a time when nanotechnology was being promoted worldwide and in six research centers in Israel's universities, Prof. Messer-Yaron, then head of the Porter School, sought to investigate the social and ethical aspects of new scientific technologies in a conference held under the auspices of the Porter School in cooperation with the British Embassy, the Fulbright US-Israel Educational Foundation and the Israel National Commission of UNESCO, with the participation of the Royal Netherlands Embassy. The conference,

entitled "Brave New World – Technologies, GMOs and Nanotechnology," was held in Israel in May 2005 and focused on freedom of scientific inquiry and society's right to protect the environment and public health. Leading experts from both the United States and Europe were invited to the conference to survey the opportunities and risks of such new technologies as genetically modified organisms and nanotechnology. Moreover, a poster competition launched among the different nanotechnology research groups drew Israeli students and researchers to the conference. In addition, an interactive display titled "Nano – What's That?" presented the latest advancements in nanotechnologies in Israel with the cooperation of the Israel Academy of Sciences and the Bloomfield Science Museum in Jerusalem, and served to open up the world of nanotechnology to young people. And just as importantly, the conference succeeded in promoting a dialogue between researchers and decision-makers in the Knesset Science Committee on the allocation of funds for nanotechnology research. In short, it embodied the goals of the Porter School: interdisciplinary cooperation and dialogue, dissemination of knowledge, engagement of the public and impact on national policy.

NEW DIRECTIONS IN GLOBAL DISCOURSE

The global dimension has also figured high in the selection of conferences and speakers. For example, a December 2006 symposium on global warming and the environment featured Nobel Prize Chemistry laureate **Paul Crutzen** of the Max Planck Institute in Germany, who discussed his controversial theory that releasing particles of sulfur into the atmosphere could artificially cool the global climate. Other scientists at the conference presented climate change forecasts for Israel in the coming decades, looking at the impact of global warming on Israeli agriculture and assessing its potential social and economic costs. The conference, which was attended by Israel's Minister of Environmental Protection, was co-organized by the English Speaking Friends of Tel Aviv University in honor of their fifteenth anniversary.

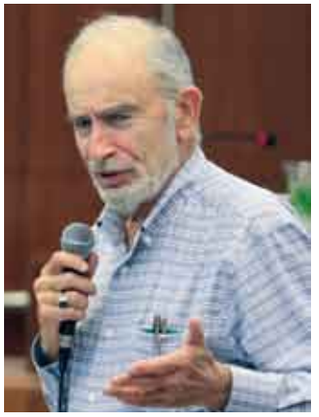
An international conference entitled "Peace Parks on Israel's Borders," held in January 2007, sought to answer the question of how environmental concepts can be integrated into peace building or conflict resolution. The keynote address was delivered by Prof. Saleem Ali of the Rubenstein School of Environment and Natural Resources at the University of Vermont who looked at international examples of peace parks and stressed that even in the face of long-lasting conflict between warring nations, peace parks have been successfully established and play a critical role in maintaining open communication among nations. Subsequent sessions featured presentations by representatives of the co-sponsors of the event, including the Moshe Dayan Center for Middle Eastern and African Studies, the Tami Steinmetz Center for Peace Research, the S. Daniel Abraham Center for International and Regional Studies, and the University Institute for Diplomacy and Regional Cooperation of Tel Aviv University.

Recent years have seen more and more conferences focus on the links between environment and economy. In a roundtable discussion on "The Business Case for Environmental Protection," organized in October 2008 by the Porter School, the Akirov Institute for Business and the Environment (recently renamed the Institute for Business, Environment and Society), the American Embassy and the Ministry of Environmental Protection, the key speaker, US Environmental Protection Agency (EPA) Administrator Mr. Stephen Johnson, specifically related to the inextricable link between economy and environment. He commended efforts to "break down the barriers among various scientific disciplines and between scientists and economists" and added that while progress was being made, it would "no doubt be faster when environmental scientists and regulatory managers coming out of graduate schools have a broader interdisciplinary perspective of their missions."

Four years later, in September 2012, in a conference organized by the Porter School, the Akirov Institute of Business and the Environment, and the Ministry of Environmental Protection, USEPA Administrator **Lisa Jackson** addressed a packed auditorium on the subject of "green growth." The conference, entitled "A Vision for Green Growth: Sustainability, Innovation and Partnership," drew unprecedented response, with hundreds of participants at the conference on campus and many more, both in Israel

and worldwide, watching the proceedings online. Ms. Jackson congratulated Israel on its green growth strategy, which was subsequently discussed by a panel of speakers, and cited the country's leadership in research and technological innovation. She then went on to describe the EPA's actions on behalf of a green economy, highlighting the fact that strategic partnerships in the environmental field can serve as strong engines for economic growth.

Connections between disciplines and between sectors were also addressed in a March 2012 conference organized by the Porter School in cooperation with the Heschel Center, the Akirov Institute for Business and the Environment and the "Hakaveret" network. Entitled "Beyond 2012 – The Rules Vary," the conference dealt with the development of a new language and new tools for the optimum treatment of economic, environmental and social issues, with the participation of local and international experts. Lectures were delivered by Karl Henrik Robert, a Swedish cancer scientist, known for "The Natural Step," a framework that lays out the system conditions for sustainability, and Bernard Lietaer, author of "The Future of Money," and an international expert on the design and implementation of currency systems.



In November 2012, **Prof. Paul Ehrlich**, renowned author of the controversial 1968 book "The Population Bomb" and president of the Center for Conservation Biology at Stanford University, was the guest speaker at a conference on "Population Increase and the Impact on Environmental Resources" hosted by the Porter School and the Israeli Society of Ecology and Environmental Science. His keynote lecture, entitled "The Population Bomb Revisited," related to the threats facing civilization today – from climate change to land degradation to loss of biodiversity. To address these problems, Prof. Ehrlich called for greater cooperation among disciplines, including science, art and the social sciences. While Prof. Ehrlich focused on the global perspective of the problem, Israeli speakers at the conference emphasized the local impact on the environment – Prof. Dan Rabinowitz of the Department of Sociology and Anthropology at Tel Aviv University, who currently serves as head of the Porter School, spoke about the implications of Zionism's population policy, Prof. Uri Shamir of the Faculty of Civil and Environmental Engineering at the Technion spoke about managing the water sector under conditions of scarcity, while Prof. Tamar Dayan of Tel Aviv University's Department of Zoology talked about the impact of population increase on biodiversity in Israel.

CONTINUING THE COMMITMENT TO TRANSPARENT PUBLIC DISCOURSE

Porter School conferences are as multifaceted as the School itself. They serve a number of goals: to develop solution driven approaches to environmental issues based on an interdisciplinary and transparent process; to supplement existing knowledge on innovative environmental fields by bringing in international experts as keynote speakers; to provide a platform for researchers and students at both Tel Aviv University and other academic settings to present their interdisciplinary findings; to provide a meeting ground for different perspectives on common issues; to raise public awareness of key issues and ensure that all voices are heard by both the general public and decision-makers; to advance new areas of practical research and strengthen the links between the School and leading environmental organizations and experts in both Israel and abroad.

Shani Yeshurun, resource development coordinator at the Porter School since 2011, attests to the growing reputation of the School as a major academic platform for interdisciplinary environmental conferences. In recognition of this reputation, the Porter School is frequently approached by students and researchers, academic institutions and industrial bodies, government agencies and NGOs to provide an academic platform for interdisciplinary dialogue aimed at improving Israel's environment.

In recent years, the Porter School has designated specific areas for cooperation with partners outside academia in order to have the most effect on public policy and discourse. It has partnered with the Ministry of Environmental Protection in an annual conference highlighting environmental research as well as in additional conferences aimed at presenting major environmental issues on the national agenda. Similarly, together with the Akirov Institute for Business and the Environment, the Environmental Services Company Ltd., Yuval Levy & Co. Law Offices, and other bodies, it co-sponsored an annual conference entitled Environment 2050, which aimed to promote dialogue among the business and financial sectors and academia, government and the third sector. In recent years, a "Research for Thought" segment was added to each session in which Porter School students presented their research findings. In addition, the School co-organized an Environment Managers' Forum with the Akirov Institute for Business and the Environment, Aviv Consulting, and other bodies to provide a meeting place for environmental managers from leading companies and organizations in which to discuss key environmental issues on the corporate and public agenda.

As environmental awareness in Israel continues to grow, so does the need for honest and transparent public discourse on interdisciplinary environmental issues that touch upon the lives of people everywhere. The rich schedule of workshops and conferences offered by the Porter School, in collaboration with a wide range of bodies, to hundreds of participants from every sector free of charge fulfills this pressing need. Whether the subject is environmental compliance in industrial practices, green growth, or sustainable building, the Porter School is determined to reach out to sectors beyond academia to disseminate knowledge, promote environmental thinking and advance sustainable policies in Israel.

interdisciplinary dialogue aimed at improving israel's environment

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Clinical training, which has always been an integral part of education in medical schools, has begun to play an important role in other fields at universities worldwide. For that purpose, clinics have been established in fields such as law, where student knowledge can be applied for the benefit of the community. Clinics stretch the borders of the university and enrich both the educational experience of the student and the society in which he or she lives.

"The idea of setting up interdisciplinary environmental clinics was a direct result of the emphasis of the Porter School on applied research. It was important for the School to have an impact outside the university walls. Clinics were our best tool for bridging the theoretical academic side and practical work on behalf of the community. I believe that this can be done in every field to transform theory into practice," says Dr. Nesher.

Linking academic study with the improvement of society has always been a pivotal goal of Dame Shirley. The clinics fulfill her vision of "using education to make a difference and impact on the general public." In line with this vision, clinics have proven crucial in the School's larger effort to inculcate social and environmental values and a heightened sense of professional responsibility in Israeli professionals in different disciplines at an early stage of their careers.

ESTABLISHING THE FIRST CLINIC ON ENVIRONMENTAL JUSTICE

The Environmental Justice Clinic was a milestone in the history of the Porter School.

The idea of setting up an Environmental Justice Clinic that would combine academic study with *pro bono* work in the service of environmental organizations and disadvantaged communities came early in the history of the Porter School. It was a part of the School's drive for innovation – linking disciplines to create new fields.

The idea was the brainchild of **Justice Daniel Fisch**, today a Haifa district court judge, who formerly served as legal advisor and director of one of Israel's major environmental advocacy groups – the Israel Union for Environmental Defense (IUED). The circumstances and the timing proved right for the establishment of the clinic. Justice Fisch taught the popular introductory course on Environmental Law offered by the Porter School in its first year; the law clinic programs, run by Prof. Neta Ziv within the framework of Tel Aviv University's Law Faculty, were expanding; and Prof. Menachem Mautner, then dean of the Law Faculty, gave a green light to the idea of setting up Israel's first environmental law clinic at Tel Aviv University. The Porter School immediately set out to recruit the necessary funds and to provide the appropriate framework. By 2001, the Environmental Justice Clinic became a reality.

"The Environmental Justice Clinic represented the first time that the field of environmental law was recognized in an academic setting in Israel," says Dr. Nesher. It provided law students, most of them in their third year, with the opportunity to make a real difference in Israel's quality of life and the environment by combining the study of environmental law and the advancement of environmental justice.

Yet law students were not the only ones to attend the clinic. Prof. Zev Levin, the first head of the School, insisted that "since the law clinic was to be multidisciplinary, it should be open not only to law students but to students from other disciplines." He strongly felt that "students from other disciplines should know about environmental law to enable them to better deal with

Students of the Environmental Justice Clinic at a study tour of a waste dump

environmental issues and allow them to give expert opinions in court." As a result, a group of students from such disciplines as the exact sciences, medicine, economics and life sciences took part in the Clinic every year.

The Environmental Justice Clinic was a milestone in the history of the Porter School. "At the time, there was no other university or college in Israel with an environmental clinic," says Justice Fisch. "Clinics were commonly perceived as human rights clinics dealing with individual cases of wrongs against individuals. Setting up an environmental law clinic was not easy since environmental justice encompasses political and economic elements, which can lead to conflicts of interests. But the approach of the Porter School was 'just do it.' It is the only

academic framework with a true 100% activist approach. Answers were always found to practical and administrative problems. As a result, we functioned as a fully-fledged environmental law clinic from the first year of operation. Everything worked smoothly with no interference and minimal red tape."

With the assistance of **Att. Liat Golan**, an enthusiastic young environmental lawyer who had just completed her clerkship at the IUED, the Environmental Justice Clinic quickly evolved into one of the most popular clinics at the Law Faculty. "Liat turned out to be a natural teacher who taught and counseled students not much younger than herself," recalls Justice Fisch. The lack of computers, furniture and even a room did not stop the Clinic in its first months. Used furniture was found, Justice Fisch used his personal laptop, and Att. Golan met the students in the library. "There was something special about the Clinic in the beginning. The combination of commitment, leadership and personality was our recipe for success," reminisces Att. Golan.

"It was like trying to run a law office with students as partners, and we had great students who cared about what they did. They had energy and fire," recalls Justice Fisch. "They looked at the issues with the eyes of a newborn and allowed us to see things through their eyes as if seeing them for the first time."

The students answered the phone, listened to requests, worked in pairs on chosen cases, presented the cases for critique at weekly brainstorming sessions and learned strategic thinking. "The idea was to empower the students and make them feel this is their case and they are responsible for it. I sat with students for hours in front of the computer and we worked carefully through the petitions, so that they would understand the process. They chose the case, they talked to the client and they took as much responsibility as was possible," says Att. Golan.

The results were gratifying. The students conducted *pro bono* environmental work for clients such as environmental organizations or local resident groups which did not have the means to hire private lawyers; their practical work was supported by a weekly academic class dedicated to discussing the theory behind the clinical issues. In some cases, the Clinic represented residents of low-income communities who were exposed to serious environmental nuisances created by quarries, sewage, garbage dumps or polluting industrial plants. In other cases, it focused on such issues as keeping beaches open to the public or opposing illegal billboards on interurban roads that blight the landscape and endanger drivers. In still other instances, Clinic students helped promote legislative amendments and policy changes including an amendment to the Freedom of Information Law that requires public agencies to publish their environmental information, regulations requiring the labeling of genetically modified food, and a "polluter pays" law that substantially increases the fines for environmental pollution.

A good example of the Clinic's out-of-the-box thinking related to a petition to the High Court of Justice against a construction plan in the northern part of Jerusalem which served as a habitat for the Israeli mountain gazelle. "At the time, there was not enough consideration of nature and species conservation interests," says Att. Tal Rotem, previously a student at the Clinic and today a lawyer at the Ministry of Environmental Protection. "It was important to find a way to draw attention to nature." The innovative strategy for doing so was to give the gazelle legal standing in the case which changed the balance of interests in the development plan and brought into sharp focus the short-term human interests, on one hand, and the protection of wildlife, on the other. Adding the gazelle as a petitioner sent a clear message.

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IMPROVING QUALITY OF LIFE AND THE ENVIRONMENT: A CASE STUDY

The case of the Hebron River was a groundbreaker. It concerned municipal and industrial sewage that emptied into a stream flowing through Bedouin communities near Beersheba.

The case of the Hebron River was a groundbreaker. It concerned municipal and industrial sewage that emptied into a stream flowing through Bedouin communities near Beersheba. Residents and children on their way to school came into contact with sewage that ran through their village, a problem compounded by odors, mosquitoes, flies and rodents. There were no bridges to cross the stream and during the winter floods the situation was intolerable.

In light of the inaction of the State in addressing the problem, the Clinic filed a petition to the High Court of Justice to receive a temporary remedy in the form of a bridge that would allow safe passage across the stream, and a permanent order to the State authorities responsible for public health to prepare a comprehensive sewage treatment plan.

Students and staffers at the Clinic worked hard to present a strong case. One of the students, studying for a second degree in microbiology, prepared much of the scientific material, including on-site testing and analysis. Staff and students appeared before a special Knesset sub-committee that held hearings on sewage and water problems of the Bedouin population in the Negev. At the same time, film students at Tel Aviv University produced a documentary highlighting the human side of the story.

In April 2002, the Supreme Court handed down a striking landmark decision in constitutional law. "The State claimed that it was impossible to construct temporary bridges because such construction requires the submission of a plan under the Planning and Building Law," says Justice Fisch. He well remembers the anger of Justice Eliahu Matza at the absurdity of the demand to adhere to lengthy planning and building procedures in the face of critical safety and health issues. The Supreme Court ordered the State to put up the bridges. In so doing, it declared its authority to act outside parliamentary laws when necessary, setting a precedent for its use of non-conventional powers in extreme cases when immediate steps are needed.

The case has become a symbol of the drive for environmental justice in Israel, exemplifying both the Clinic's unique educational value and its potential to impact on key environmental issues.

EVOLUTION OF THE ENVIRONMENTAL JUSTICE CLINIC

To a large extent, the academic directors of the Environmental Justice Clinic set its tone. "Each of the supervisors brought himself to the Clinic," says Att. Golan. Justice Fisch integrated the academic coursework and the Clinic, assembling the students around a table to discuss cases with a focus on practicalities such as resolving dilemmas, deciding on tactics and discovering optimal ways to represent the client. His successor, Dr. Dov Khenin, a former post-doctoral Porter Fellow who worked with Att. Golan before his election to the Israel Knesset, focused on environmental issues such as global warming, highlighting an environmental vision based on environmental and social justice. Dr. David Schorr, another Porter Fellow who served as the third director of the Clinic, emphasized the links between theory and practice, both in connection with specific cases under discussion and in connection with international developments.

The ripple effect of the success story led to additional innovations. A Law and Environment Program was founded at Tel Aviv University in 2006 to promote the study of environmental law in Israel and advance environmental issues at various levels of the academy. In parallel, a Law and the Environment Workshop was established as the first such workshop in Israel, providing a forum in which environmental law scholars and advanced level students could exchange ideas and discuss cutting-edge environmental law scholarship. The Law Faculty, in cooperation with the Heschel Center and the Porter School, also established an Environmental Film Club. It screens environmental films accompanied by discussions of their content and impact on the environment and society.

Once the Law Faculty realized the importance of the Clinic it began to take more responsibility for it. The Faculty now funds the Clinic and its cases largely center on questions of social justice. Yet, without doubt, the impact of the Porter School on the Law Faculty of Tel Aviv University and on the field of environmental law in Israel has been dramatic. More than a hundred students have taken part in the Environmental Justice Clinic. Many of them are now using the knowledge and experience they gained to make a real difference in the environment in Israel, whether in government, industry, academia or environmental organizations.

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THE ENVIRONMENTAL SIMULATION LABORATORY

Environmental projects that stretch the disciplinary boundaries of the university were high on the priority list of the Porter School from the start. Therefore, in addition to establishing the Environmental Justice Clinic, the Porter School promoted other clinics in its early years, several of them concentrating on improving quality of life in Israel's urban environment.

The Environmental Simulation Laboratory was one of the first initiatives. It was modeled on the Environmental Simulation Center set up at the New School for Social Research in New York. Dr. Nesher initiated the project by introducing the idea to the Revson Foundation; Dame Shirley's meeting with the president of the Foundation, Eli Evans, brought it from vision to reality. The result: a $1.4 million commitment for the establishment of an Environmental Simulation Laboratory for a four-year period. "This was the largest contribution from an outside source other than the Porter Foundation," says Dr. Nesher. "We had no students at the time, but the aim was to set up the laboratory within the framework of an academic unit – the Department of Geography and Human Environment."

The aim of the Lab, under the directorship of Prof. Juval Portugali, was two-fold: to develop research in cutting-edge simulation technologies and modeling approaches and to contribute to environmental betterment in Israel through community outreach. One of the Lab's most notable achievements was a computerized model for a virtual Tel Aviv, which provided users with a 3-D simulation of the city that could be navigated through the eyes of pedestrians, vehicles and airplanes. This virtual environment was used by the Lab to model factors such as urban accessibility, air pollution dispersion and the impacts of socio-economic change and planning policy on the emerging urban environment.

Major emphasis was placed on cooperation and collaboration with other agencies both in Israel and abroad in order to apply the technology developed in the Lab to public education and participation. One program, in cooperation with the Council for a Beautiful Israel, enabled children to experiment with planning the old Tel Aviv port area; another, an "AccessCity" model, developed with the IUED, addressed environmental justice issues such as public access to open space. Collaboration also extended to researchers on the international front as witnessed by an international workshop convened in Venice in 2004 on the "Study of Complex Artificial Environments." The success of the conference, attended by experts from leading environmental simulation laboratories around the world, prompted an initiative by the Springer publishing house to develop the proceedings into a book, edited by Prof. Portugali and published in 2005.

GREEN ARCHITECTURE AND ENVIRONMENT

Recognition of the importance of green architecture to quality of life and the environment also came early in the history of the Porter School. Increasing awareness of the impact of buildings on resource and energy use led to a growing demand for architects with expertise in environmentally conscious design and building. The Porter School was determined to respond to the challenge.

"Knowledge of green architecture and the ways in which it relates to energy and climate were not integrated into the curriculum at the time," says Dr. Nesher, an architect and city planner by profession. "In fact, budgetary allocations for research on sustainable architecture were simply non-existent. Instructors and lecturers were practitioners with no academic standing." The Porter School changed all this. "We opened a door, allowing for integration between architecture and environmental courses – and for cooperation between the Porter School and the School of Architecture at Tel Aviv University," explains Dr. Nesher. "In the future, we hope to extend the collaboration to additional faculties such as engineering and medicine due to the interrelations between these areas at the level of the individual structure, the neighborhood and the city. The Porter School with its interdisciplinary approach can provide the platform for such coordination."

The Porter School has indeed served as a platform for innovation in green architecture from as far back as 2001 when it pioneered a Joint Initiative on Green Architecture, in cooperation with the Azrieli School of Architecture at Tel Aviv University. The core feature of the Initiative was a Studio on Green Architecture, made possible by the generous support of the Sara Fine Philanthropic Fund. It provided students with their first introduction to urban environmental architecture and offered them a unique opportunity to combine theory and practice on green building. In the very first year of the Studio, students took part in designing plans for the deteriorating coastline near Herzliya and in the restoration of the Apollonia Coastal Archaeological

"We opened a door, allowing for integration between architecture and environmental courses – and for cooperation between the Porter School and the School of Architecture at Tel Aviv University."

Architect Daniel Wachtel with students of the Incubator for Sustainable Architecture, Ecology and Society

Park. The students' suggestions were partially implemented, as they were adopted in the master plan for the site. Significantly, the students were also awarded prizes in a competition for the design of what was to be a future green building of the Porter School.

In 2003, the Joint Initiative was broadened into an Incubator for Sustainable Architecture, Ecology and Society aimed at expanding the accumulated knowledge on green architecture and sustainable planning, on the one hand, and educating students to serve as ambassadors of green architecture in practice, on the other. The Architectural Incubator, headed by Architect Daniel Wachtel, was the first program of its kind in Israel to combine theoretical education on urban sustainability and hands-on experience in studio seminars on green architecture. As a core element of architectural studies at the university, it became the standard bearer of green architecture in Israeli academia, helping to create the new field of green architecture in Israel.

The projects implemented by the Architectural Incubator were wide-ranging – from collaborative work with communities in Netanya and Jerusalem on the design of new community centers to an alternative proposal for the development of a Bedouin town in the south of the country and a plan for a Druse village in the north.

By 2003, the Porter School, in cooperation with the School of Architecture, offered Israel's first course on green architecture, and with the subsequent launch of the master's and doctoral programs, students with backgrounds

The Architectural Incubator was the first program of its kind in Israel to combine theoretical education on urban sustainability and hands-on experience in studio seminars on green architecture. As a core element of architectural studies at the university, it became the standard bearer of green architecture in Israeli academia, helping to create the new field of green architecture in Israel.

in architecture, planning, landscape design and urban sustainability opted to focus their research on different aspects of green building. In recent years, the non-thesis master's program has also attracted professionals wishing to increase their knowledge in the field. Today, students at the Porter School conduct innovative studies on different facets of green building including its economic, policy, regulatory and urban sustainability aspects.

An especially fond memory for Dame Shirley is "Project 2020," an environmental education initiative undertaken in collaboration with the Tel Aviv Municipality, co-sponsored by the Ministries of Education and Environmental Protection. The project embodied Dame Shirley's vision of partnerships for a more sustainable future based on education and a healthy urban environment. As part of the project, architectural students from Tel Aviv University teamed up with schools in the Tel Aviv region to discuss and promote urban sustainability projects, including green building, wastewater recycling, Mediterranean shoreline protection, and rehabilitation of the Yarkon River. One of the projects, in which fourteen schools took part, focused on the impact of the shoreline on the city of Tel Aviv, with final projects addressing such issues as treatment of polluted seawater, conservation of sand resources, and impact of cliff erosion on marine life. Displays of the projects were showcased at a conference with the participation of both the Mayor of Tel Aviv and the Minister of Environmental Protection. This project brought the study of environment and urbanism into the curriculum of the Tel Aviv educational system where it has remained as a permanent addition to the program of study in the middle schools.

THE ENVIRONMENTAL POLICY CLINIC

During the 2008/2009 academic year, the seeds of yet another clinic were sown at Tel Aviv University within the framework of a seminar on public policy. The successful "pilot" led to the inauguration of an Environmental Policy Clinic by the Porter School and the Department of Public Policy the following year, with the generous support of a major foundation. The Clinic itself is run by two directors whose association with the Porter School is especially close: **Dr. Dorit Kerret,** a faculty member at the Department of Public Policy and a former Porter Fellow, serves as the academic director of the Clinic while **Tamar Neugarten**, a graduate of the School's master's program and now a doctoral student, serves as its professional director.

The Clinic follows the Porter School model, with a focus on both theory and practice. A first semester of theoretical study is followed by a second semester of client interaction, which enables students to gain hands-on experience while providing practical assistance and policy recommendations to the participating organizations. The Clinic is open to master's students as well as third year undergraduate students in relevant fields in order to encourage an interdisciplinary approach, using skill sets from different fields.

In its first years, the Environmental Policy Clinic focused on local authorities and their role in making environmental information accessible to the public in accordance with the 2009 Freedom of Information Regulations. Through interviews with relevant personnel in local authorities, students in the Clinic

produced specific recommendations for the effective implementation of the new regulations. The recommendations were published in a "dos and don'ts" guide directed at municipalities and were discussed at a public conference attended by local municipality representatives, environmental and social activists and students. Subsequently, the Clinic widened its scope also to the governmental level, with students examining – and formulating recommendations for – the accessibility of environmental information in relevant ministries, including the Ministry of Health, Ministry of Transport, Ministry of Agriculture and Ministry of Energy and Water.

The Clinic also cooperated with other actors in order to increase its impact: In one case, several students conducted a study, in cooperation with Life and Environment (the umbrella organization of environmental NGOs in Israel), on the role of Israel's municipal environmental committees in the formulation of environmental policy. The study resulted in a dedicated training session for the committees' members, in which conclusions and recommendations of the study were shared and discussed. In another case, this time in collaboration with the Ministry of Environmental Protection, the students' research assisted in setting guidelines for preventing "greenwash" and for adopting criteria for the display of environmental information on products.

The Environmental Policy Clinic has become a pivotal body of knowledge on environmental transparency in Israel, and its directors have been

the environmental policy clinic has become **a pivotal body of knowledge on environmental transparency in israel**, and its directors have been invited to participate in various steering committees.

invited to participate in various steering committees, such as that of the "e-government" project of Forum 15 (the Israeli Forum of Self-Government Cities, which represents most of Israel's large cities), as well as of the "Transparency Index for Local Authorities," an initiative of the NGO Transparency International Israel (ICL).

A conference convened by the Porter School in October 2010, entitled "Beyond the Ivory Tower: The Contribution of Academic Research to the Creation of Environmental Policy," captured the goal of the Clinic – namely, developing practical recommendations for environmental policy-making by increasing the links between academic policy research and practice in the field. At the conference, Dr. Kerret underlined the importance of close cooperation between academia and environmental policy-makers. "On the one hand," she said, "researchers must learn to take account of the critical needs of decision-makers. On the other hand, public representatives must learn to rely on the major reservoirs of knowledge and ability offered by academia. We are here to make sure this happens!"

"Providing a bridge between the generation and the application of knowledge is one of the Porter School's main goals," says Dr. Nesher. "It is for this reason that we create platforms for interdisciplinary action, in which people from different professions and different sectors can come together, communicate and cooperate for the benefit of society as a whole."

IDENTITY AND ENVIRONMENTAL ACTION LABORATORY

Until recently, environmental research and education have largely concentrated on science and technology, with studies on environmental sociology and economics mostly focusing on top-down policies of large-scale actors such as the State, corporations, professional bodies or the media. However, while the need for socio-cultural change to achieve a sustainable lifestyle has long been recognized, knowledge about the interaction between environmental and cultural factors has been lacking. Here is where research in the humanities plays a major role. To gain a deeper understanding of the relationship between perceptions of the environment and collective identity, the Porter School and the Unit of Culture Research at Tel Aviv University's Faculty of Humanities, have joined together to establish an Identity and Environmental Action Laboratory.

The Laboratory, headed by Prof. Rakefet Sela-Sheffy of the Unit of Culture Research, combines theoretical learning and fieldwork and focuses on the environmental movement in the context of identity formation and social change. "Most sociologists of the environment feel that despite the growth in environmental discourse and environmental awareness, very little is known about the complex motives and socio-cultural resources of the target communities, which constrain or encourage their receptiveness to environmental attitudes and action," says Prof. Sela-Sheffy. "The Identity and Environmental Action Laboratory, therefore, aims to contribute to our knowledge of the interaction between the environmental movement and cultural change through researching both activist groups and target communities and to facilitate the use of this knowledge by environmental organizations and education programs for promoting community environmentalism in Israel."

The Laboratory is targeted at graduate students of the Unit of Culture Research, the Porter School and the Faculties of Social Sciences and

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Humanities and includes a theoretical-methodological seminar in the first semester, in which individual case studies are designed and assigned to student groups, and fieldwork in the second semester, during which the projects are carried out, analyzed and presented. The Laboratory structure creates an academic framework for empirical qualitative research into grassroots environmentalism while giving students the opportunity to apply their interdisciplinary academic training in practical work outside the university, using in-depth interviewing, narrative research and participatory observation methodologies. This framework responds to the demand of students for studying the human factor in environmental processes and social change in general. At the same time, major attention is given to cooperation with environmental organizations to facilitate the dissemination of accumulated knowledge and to links with similar academic research projects abroad in order to assure the exchange of knowledge.

Porter School students have taken part in the Laboratory from the very start, and several of them have opted to develop their personal research projects into second and third degree theses. Noam Zaradez, for example, a Porter School student, completed his master's thesis on the professional identity of teachers of environmental education in Israel in 2011, and is working on his doctoral thesis on teachers as agents-of-change in the formal and informal educational frameworks in Israel, under the supervision of Prof. Tali Tal of the Department of Education in Science and Technology at the Technion and Prof. Sela-Sheffy. Lara Paran completed her master's thesis on "The Dynamics of Local Environmental Struggle: Structural and Cultural Aspects," under the supervision of Prof. Isaak Omer of the Department of Geography and Human Environment and Prof. Sela-Sheffy. And Keren Yavetz completed her thesis on "Enchanted by the Garden: Women Leading Community Gardens Activity in the Tel Aviv Metropolitan Area," under the supervision of Prof. Tovi Fenster of the Department of Geography and Human Environment and Prof. Sela-Sheffy. "Hopefully," says Prof. Sela-Sheffy, "the Laboratory will continue to provide innovative new directions of research to Porter School students which will, in turn, promote a more sustainable lifestyle among people in communities throughout Israel."

FURTHER STRETCHING THE BORDERS

"My dream is to establish a permanent Laboratory for Society and Environment which will invite research students from the entire university to be part of a thinking group which looks at environmental problems using research tools from the humanities and the social sciences."

Clinics and laboratories have been important components of the Porter School interdisciplinary model from the start. To a large extent, the clinics and laboratories themselves have created interdisciplinary projects, which take a problem and tackle it from different perspectives in order to arrive at a solution. However, while the Porter School has prepared the groundwork for numerous clinics in cooperation with different faculties at Tel Aviv University, its own students have often constituted only a small percentage of those enrolled in the clinics. In the case of law and architecture, this was largely because these clinics were designated for first-degree students while the Porter School serves second and third degree students. In the case of other clinics, the rigorous course requirements of the thesis-based master's program have not provided students with the necessary flexibility to take part in the clinics that typically require a major investment of time. Therefore, unless the clinical programs directly relate to their specialty, students in the research track have tended to pass them by. This has changed with the opening of the non-thesis master's program.

At the same time, new ideas for laboratories that combine theory and practice have continued to sprout in recent years, in collaboration with units and departments at Tel Aviv University associated with the soft sciences. One of them, a Society and Environment Laboratory, launched in the 2013/2014 academic year, is a brainchild of Prof. Dan Rabinowitz of the Department of Sociology and Anthropology at the Faculty of Social Sciences, who was appointed head of the Porter School in October 2013.

The idea for the Laboratory, says Prof. Rabinowitz, who has accompanied the Porter School on its interdisciplinary path from the start, came in the wake of a highly successful research seminar for graduate students he taught in the 2011/2012 academic year. The seminar attracted students from different faculties, most of them Porter School students, and provided them with a unique opportunity to exchange ideas on the social aspects of the environment. "The Sunday afternoon seminar became a highlight of the academic year for me and for my students," says Prof. Rabinowitz. "The diversity of subjects which we discussed was fascinating – ranging from a lexical and philosophical analysis of the term sustainability to the ways in which traditional agriculture in the Arab sector conforms to the criteria of sustainable agriculture, from the tension between human settlement and the preservation of open space in the Arava region of Israel to the preservation of wildflowers in apartment house gardens in Tel Aviv. My dream is to establish a permanent Laboratory for Society and Environment which will invite research students from the entire university to be part of a thinking group which looks at environmental problems using research tools from the humanities and the social sciences."

THE INSTITUTE FOR BUSINESS, ENVIRONMENT AND SOCIETY

The disciplinary boundaries at Tel Aviv University were further stretched with the founding of the Akirov Institute for Business and the Environment in 2007. Initially established with the generous donation of Mr. Alfred Akirov and the Elroy Co. and with the active support of Prof. Asher Tishler, dean of the Faculty of Management, the Institute was a joint initiative of the Faculty of Management - Recanati Graduate School of Business Administration, the Porter School of Environmental Studies, the Berglas School of Economics, and the Buchmann Faculty of Law. Renamed the Institute for Business, Environment and Society in 2013, the joint institute of the Recanati Business School and the Porter School aims to advance the links between business, environment and society among faculty members and students at Tel Aviv University, to raise awareness of environmental and social concerns within the general public and the business community, and to advance the integration of environmental and social considerations in decision-making processes, particularly within the business sector.

In 2007, Att. Liat Golan, who played a pivotal role in the establishment of the Environmental Justice Clinic, was chosen to manage the newly founded institute. She readily took on the challenge of opening up a new interdisciplinary field in Israel once more – replicating the success of the Environmental Justice Clinic. And again, the circumstances were right to make it happen: a donor – Alfred Akirov; his daughter Sharon, who cared deeply about the subject; the president of Tel Aviv University – Prof. Itamar Rabinovich who was open to the idea; **Prof. Yehuda Kahane**, a senior faculty member of the School of Management and a leading international expert on risk management, who agreed to head the Institute; and Dr. Nesher and his dedicated staff.

The vision for the Institute – developing a new field in the university through courses, research, seminars and community outreach, based on interdisciplinary partnerships and the practical application of academic knowledge – fully corresponded to the Porter School model. "It was not surprising," says Att. Golan "that the Porter School was the main catalyst for the Institute, helping to get it off the ground, providing the initial funds. It deserves the credit for initiating, pushing, accompanying, supervising, brainstorming. The School was there when it was needed – providing computers, a telephone line, offices, administration, commitment, consultation opportunities and think tanks – everything necessary to make it all happen."

However, the challenges were enormous. "The idea was to advance the subject of business and environment at Tel Aviv University, but knowledge in the field was non-existent," says Att. Golan. "We had to build something entirely new. Therefore, we focused our first efforts on raising awareness, through seminars that were open to the academic world, to corporate leaders and to the general public. We introduced new courses on various aspects of business and the environment into the academic curriculum of Tel Aviv University's Graduate School of Business Administration to provide initial training, and the demand was great – well beyond our expectations."

Today's business sector, in both Israel and the world, has no choice but to become environmentally aware, says Prof. Kahane. The mission of the Institute, therefore, is "to bring this critical understanding to the present and future leaders of Israel's business community, and to help them make a vital conceptual change - the earlier the better!"

In order to fulfill this mission, the Institute targeted different audiences in partnership with government ministries, research institutes, the business sector and a wide gamut of organizations. Firstly, it provided students with the tools necessary to become responsible managers, with the capacity to meet both the risks and opportunities created by a rapidly changing natural and corporate environment. Secondly, it promoted multidisciplinary academic research on the multifaceted theme of business and environment. Thirdly, it reached beyond the halls of academia – organizing national and international conferences, lectures, forums, seminars and workshops aimed at bringing the most advanced knowledge in the field of sustainable development to Israel's business community.

"The Institute was the first of its kind to address environmental management in the private sector in a scholarly way. That's where it can make the biggest impact – on both the consumption and production sides. Impacting on the way consumers relate to materials – influencing their choices and life styles – it's a great opportunity and clearly there is a call for it. As soon as courses are offered, they are filled up. There is major demand," says Dr. David Katz, a specialist in environmental economics and corporate environmental strategy and a former Porter Fellow, who was appointed professional director of the Institute in 2010.

The activities of the Institute have continued to grow under the professional directorship of **Sagit Porat** who previously served as deputy director of Life and Environment, the umbrella

"I want managers to understand the economic significance of their environmental impacts, based on such tools as sustainable product life cycle management. Managers must look at the impacts of their products throughout the life cycle of a product and not only during the manufacturing process."

organization of environmental NGOs in Israel, where her work focused on climate change, sustainability policy and the relationships between NGOs, government and the business sector.

While in its initial year the first academic courses were offered to master's students at the Faculty of Management, the Institute has subsequently promoted a wide variety of courses at different faculties to hundreds of students, including courses on corporate environmental strategy, environmental economics, environmental risk management, green supply chain management, product life cycle assessment, industrial ecology, and more. At the same time, it has supported wide-ranging research on environmental management, economics, and policy by both faculty and graduate students. Institute researchers have also been involved in a number of local and international research consortia, which are critical to advancing the state of business knowledge and practice, allowing Israel to learn from and share with its international partners.

Most importantly, the Institute has introduced innovative fields of research and study into the university. **Dr. Vered Blass** introduced industrial ecology – virtually unknown in academia in Israel – into the curriculum. With a PhD in Environmental Science and Management from the University of California, Santa Barbara, Dr. Blass brought the knowledge and expertise she had accumulated during her graduate studies in the United States in the fields of industrial ecology and corporate environmental management to Israel.

The new field which Dr. Blass introduced to Tel Aviv University has drawn dozens of students who participate in the innovative courses which she teaches as well as a group of master's and PhD students who take part in her Industrial Ecology Lab, most of them from the Porter School. Her research focuses on the nexus between industrial ecology and management science disciplines, with a concentration on decision-making and measurement of economic and environmental performance using a diverse set of tools and analysis methods. "I want managers to understand the economic significance of their environmental impacts, based on such tools as sustainable product life cycle management," she says. "Managers must look at the impacts of their products throughout the life cycle of a product and not only during the manufacturing process. Interest in the field is growing in the business sector. However, there are simply not enough people to provide the necessary expertise." Therefore," says Dr. Blass, "there is special importance in training the next generation of managers to use these innovative tools. The goal is to integrate the tools of industrial ecology into the field of management."

CENTER FOR RENEWABLE ENERGY

Tel Aviv University and the Renewable Energy Center bring together the world's leaders in renewable energy research, supplying the laboratories and the equipment necessary for scientific and technological breakthroughs. It's an exemplary model of interdisciplinary cooperation.

The interdisciplinary agenda of the Porter School is also manifested in its decision to partner in the establishment of a Research Center for Renewable Energy at Tel Aviv University together with seven faculties – Exact Sciences, Engineering, Life Sciences, Law, Management, Social Sciences and Humanities. Headed by Prof. **Yossi Rosenwaks** of the Faculty of Engineering, the Center serves as a platform and supportive environment for Tel Aviv University researchers who are developing new technologies to reduce the world's dependence on fossil fuels. Prof. Avi Kribus of the School of Mechanical Engineering at the Faculty of Engineering, whose research focuses on solar energy, thermodynamics and heat transfer, was the catalyst for the School's partnership in this unique initiative. His active association with the School dates back to his participation in the Italian-Israeli cooperation on environmental research and development and has continued throughout the years, including two years as head of the School's master's program.

"The world is currently in desperate need of green, environmentally friendly energy sources to bring an end to pollution and the continued destruction of our planet," says Prof. Yossi Rosenwaks. "Renewable energy is vitally important to the State of Israel in particular from a strategic viewpoint. Tel Aviv University and the Renewable Energy Center bring together the world's leaders in renewable energy research, supplying the laboratories and the equipment necessary for scientific and technological breakthroughs. It's an exemplary model of interdisciplinary cooperation."

Israel's greatest asset when it comes to renewable energy is the sun. Yet, two major obstacles stand in the way of turning solar energy into electricity to supply the country's energy needs: the lack of technology to allow the storage of solar energy and the technical adjustments needed to be made in Israel's existing electricity infrastructure. With 55 research groups consisting of over 300 researchers working on renewable energy across seven faculties, many within the framework of the Porter School, the investment in renewable energy research is already bearing fruits in the form of hundreds of patents filed and about a thousand scientific papers published in academic journals in the last few years, in addition to the development of innovative technologies.

At the same time, the Center holds international conventions, funds selected research projects and seeks to establish advanced laboratories in the fields of energy storage, solar energy and biomass fuel. The Porter School expects to further strengthen its links with the Center in the future, notably within the framework of its envisioned clean-tech center planned for the second stage of its building project.

THE GREENING OF TEL AVIV UNIVERSITY

Parallel to its interdisciplinary environmental programs, Tel Aviv University has spared no efforts to green its campus as well. The Campus Development Committee of the Board of Governors initiated environmental awareness on campus by calling attention to the need for action that eventually led to "green campus" accreditation. Efforts in this direction began as early as 2000 when an environmental committee was first appointed by the president of Tel Aviv University to increase environmental awareness and development throughout the campus. In May 2011, the university was accredited as a "green campus" by the Ministry of Environmental Protection, in recognition of its efforts toward sustainability. The accreditation is awarded to Israeli universities that implement programs in three key areas: environmental studies and degrees, community environmental projects and resource efficiency initiatives. The Porter School, of course, has taken a key role in transforming Tel Aviv University into a "green campus."

The greening of Tel Aviv University was facilitated by the continued work of the university's Green Campus Committee, made up of faculty members and university officials and chaired, since 2008, by the head of the Porter School. The committee, which is coordinated by Mr. Roy Kroizman, the logistics coordinator of the Porter School, has taken an active role in making the university greener and more eco-friendly.

"The preparation process for the accreditation of the university as a 'green campus' was long and exhaustive," says Roy. "We had to meet the very stringent criteria demanded by the Ministry of Environmental Protection. This required the collection and compilation of information regarding the wide range of environmental activities on campus – whether academic courses, resource efficiency or energy savings, for example. However, at the end of the day, we were able to demonstrate full compliance with the requirements and we received the accreditation. The Porter School programs were vital in the final outcome."

The accreditation committee was impressed by the wide range of advanced courses and degrees offered by the Porter School; it proved a major consideration in its decision. Resource efficiency was achieved through waste recycling, reduced paper use, green building, public transportation and cycling paths, and electricity and water savings, with the Porter School Building a prime example of the best in resource efficiency. Community projects included the environmental clinics and graduate student internship programs of the Porter School, an ecological garden maintained by volunteers and supported by the School, an environmental film club which is a joint project of the Faculty of Law, the Heschel Center and the Porter School, a Nature Campus which advances public awareness of science, nature and the environment, green summer camps and more.

One of the important projects on campus was the conversion of the university's Energy Center, which powers much of the campus's heating and cooling system, to natural gas, a move that will significantly reduce pollutant emissions into the atmosphere. Other projects, within the framework of the Center for Renewable Energy, aim at introducing renewable energy to the university, whether through the installation of large panels of solar cells on rooftops or the use of solar energy in a new student dormitory.

An organic garden on campus: an initiative of Porter School students

CONFRONTING THE CHALLENGES

"The challenge of the interdisciplinary model of the Porter School has been to find ways to do things which are not standard," says **Shula Goulden**, who was actively involved in the strategic development of the School. "Throughout its history, the School has explored the potential of reaching out and setting up a wide range of programs, some of which fared better than others."

Complex questions were always on the table, says Shula: How to set up something new? Whether to allocate resources toward the development of the School's own programs or to strengthen the environmental offerings of Tel Aviv University in general, such as clinics in other faculties? How to select priority fields for teaching and research that will reflect the School's balance between hard and soft sciences and demonstrate its interest in developing new environmental areas? How to assure the sustainability and continuity of clinics and institutes that require long-term funding for their continuous operation?

The Porter School continues to grapple with these questions today. "The establishment of a clinic is no small feat," says Dr. Nesher. "It requires special funding, special administration, and special personnel who can help locate appropriate case studies and supervise students in assimilating theory and practice. However, when all these factors come together, the results are well worth the effort." The investment, of course, is even higher when it comes to establishing new institutes or centers. Nevertheless, the Porter School remains committed to forging new partnerships with industry, government and academia to ensure that its collaborative clinics, laboratories and institutes become vibrant hubs of innovative research activity. Some of them are expected to find a home in the Porter School of Environmental Studies Building.

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forging partnerships


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"The environment is a field in which it is not enough to teach or research. It should also shape the public space."

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These words, voiced by former Tel Aviv University President Prof. Itamar Rabinovich, embody the philosophy of the Porter School. Promoting environmental awareness by means of partnerships with government, industry and non-governmental organizations (NGOs) has always been a central tenet of the School.

To a large extent, the very birth of the Porter School was a natural outgrowth of the close links forged between the Porter Foundation and several of Israel's foremost environmental organizations – whether the Society for the Protection of Nature in Israel (SPNI), the Israel Union for Environmental Defense (IUED) or the Heschel Sustainability Center.

With the founding of the School, cooperation was broadened to every sector in Israel. One of the first initiatives, dating back to 2001, was the formation of a Corporate Partners for the Environment Program, composed of leading industrial corporations with an interest in the environment, which was dedicated to supporting graduate student scholarships and university research on the environment. The director, Dr. Joyce Starr, played a major role in facilitating the Italian-Israeli collaboration on environmental technologies – one of the foremost international partnerships of the Porter School.

Mijal Ben-Dori, who joined the Porter School in 2002 as executive projects coordinator, recalls: "The School at the time was still in its infancy, but Dr. Nesher and Dame Shirley knew how to seize opportunities. I felt that I was joining two bulldozers in promoting new projects. I sensed that in joining the School I would become part of something with an added value, something that would make a difference." Mijal remembers joining Dr. Nesher in his meetings in order to better understand what the Porter School was all about. She discovered that "it was about everything." She watched Dr. Nesher "open windows just like on a computer screen" to gain entry to the world of academia, government and NGOs.

Partnerships with bodies outside the university have continued to be central to the work of the Porter School as evidenced in a wide range of initiatives and programs.

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LOCAL SUSTAINABILITY PROGRAM

The Porter School and the Heschel Center were inextricably linked from the very start. It was Dr. Yaakov Garb, on behalf of the Heschel Center, who first surveyed interdisciplinary environmental programs worldwide and presented his recommendations for the establishment of a school of environmental studies at Tel Aviv University in 1999. Significantly, one of the main points made in his report was that "the central challenge is not the extension and coordination of existing environmentally-related research and teaching. It is to change how the university engages with environmental issues and with the communities and landscapes around it."

The recommendations of the report were at one with the Heschel Center model. "We tried to do similar things. We spoke the same language. We shared the same vision," says **Dr. Orli Ronen-Rotem**, former executive director of the Center, whose doctorate focused on the impact of international philanthropic foundations, including the Porter Foundation, on local sustainability and NGOs. "It was clear to us from the beginning that academia and civil society should meet," she goes on. "What was unclear was 'how' to do this."

As it turned out, concern for local sustainability, was what cemented the relationship. "We created joint programs, such as in-service training for local authority personnel which the Porter Foundation funded, as well as professional training programs, including a course on strategic planning with the Israel Union of Local Authorities," says Dr. Ronen-Rotem.

Inspired by the model of the Green College Centre for Environmental Policy and Understanding at Oxford University, which was established in 1992 to help bridge the gap between science and environmental policy through links between academia, government and industry, the Porter School and the Heschel Center created the *Kayamut* (Sustainability) Program in Social-Environmental Policy in 2004.

The links between academia, government and NGOs were further strengthened in 2005 when the European Union LIFE Program approved funding for a capacity building project aimed at creating sustainable communities in Israel. The proposal for the project was submitted by the Heschel Center in partnership with the Porter School, the Israeli Ministry of Environmental Protection and the international local government coalition known as ICLEI (Local Governments for Sustainability). During the three years in which the €500 thousand project ran, the capacity for sustainability in Israeli local government was significantly strengthened. As a partner in the initiative, the Porter School organized conferences and hosted training courses on local sustainability targeted at municipal decision-makers and professionals in the planning, legal and policy fields. Most importantly, the project also resulted in the establishment of the Center for Local Sustainability, now directed by Att. Liat Golan, which continues to serve as an important hub for local sustainability initiatives throughout Israel. Its website is an invaluable resource for local sustainability, replete with information on sustainability plans, best practices, training sessions and publications.

"The Porter School was the academic backbone for the local sustainability program and continues to serve as a true partner of the Local Sustainability Center," says Dr. Ronen-Rotem. "I see the Porter School's success as the success of us all in the environmental movement."

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PORTER ENVIRONMENTAL INTERNSHIP PROGRAM

The Porter Environmental Internship Program was established in 2008 to train the next generation of young leaders as advocates for the environment, public health, sustainable development, and environmental and social justice.

"Academic research can sometimes sit in an 'ivory tower' focusing on pure scientific knowledge, cut off from practical life," says Prof. Pinhas Alpert, a former head of the Porter School. "In the environmental field, however, the link with the outside world is particularly crucial and practically indispensable for those who wish to deal with the most burning issues on the environmental agenda in Israel and abroad. As a result, I believe that the Porter Environmental Internship Program has a critical role to play in bridging between academia and day-to-day environmental problems."

The Porter Environmental Internship Program was established in 2008 to train the next generation of young leaders as advocates for the environment, public health, sustainable development, and environmental and social justice. The program, which has been supported by the Porter Foundation and the New Israel Fund UK and carried out jointly by the Porter School and Shatil – the New Israel Fund's Initiative for Social Change in Israel, best reflects the influence of the School on the community beyond Tel Aviv University. It enables students at the Porter School to intern at environmental organizations and in the public sector in return for a stipend. As of the 2012/2013 academic year, the Porter School has begun to fund the program together with the Green Environment Fund, a partnership of funders which aims to promote an environmentally sustainable Israel through education and outreach. "The program was modeled on the successful Everett Fellows for Social Justice, run by Shatil," says Shula Goulden, who played a central role in the establishment of the program, "in which university students from all sectors intern in social change organizations, gaining an in-depth understanding of the role of these organizations in society while providing these organizations with much needed additional personnel."

Within the framework of the program, students are given the opportunity to experience the inside operation of environmental and municipal organizations, to obtain professional experience, to apply their environmental knowledge in the field, to contribute to changes in environmental attitudes and policies and even to work for these organizations at the end of their internship. Organizations are provided with enthusiastic, motivated and knowledgeable team members equipped with the environmental expertise to better the environment. The Porter School is provided with an opportunity to strengthen its links with environmental NGOs and to involve university researchers in specific NGO projects that contribute to applied interdisciplinary research in the field.

Interns in the program contribute to and even spearhead activities that bring about national environmental policy change, advance environmental agendas and raise awareness among target audiences. They have participated in such projects as preparing an action plan for reducing greenhouse gas emissions, introducing more efficient water management processes, promoting renewable energy, planning a green belt for the Tel Aviv-Jaffa area, assisting local communities in environmental justice cases and advancing the dissemination of environmental information through the development of websites and databases.

In addition to fulfilling the requirements of their internship position, students participate in enrichment sessions aimed at broadening their exposure to environmental and social action in Israel and to strategies for environmental-social change. The sessions stress personal and professional networking among the interns themselves, and the learning process is guided and enriched by their shared experiences and challenges.

Beginning with just seven students in its first year, the program has gained increased popularity in subsequent years with an average of 15-18 students interning in more than a dozen organizations each year. The students dedicate ten hours a week throughout the academic year to their work

at the organization, taking on specific roles and leading defined projects and assignments.

One of the first interns, Orit Cohen Bar-Joseph, an architect who interned with the Movement for Israeli Urbanism while studying for her master's degree at the Porter School, found her experience to be "a wonderful opportunity to bridge the gap between the academic and 'real' worlds, to learn more about the urban environment, and to contribute my knowledge and expertise to something I strongly believe in." During her internship she collected data and case studies for a guidebook for architects, urban planners and municipal and government authorities on creating sustainable communities.

Rinat Butbul interned with Transport Today and Tomorrow, an NGO dedicated to promoting sustainable transport in Israel. Serving as its information technology coordinator, she created an electronic newsletter for the NGO and upgraded its website. The program meshed perfectly with her research interests. "Sustainable transport must be examined from many different angles. My training at the Porter School prepared me for this," she says. Moreover, since she saw her future in the world of non-profit environmental organizations, she was convinced that the Porter School Internship Program was a very good first step. "It gave me a chance to work in that world," she says. "I also liked being encouraged to learn about different subjects and do different things. It was ideal for me." Her efforts did not go unnoticed as testified by Ms. Tamar Keinan, director of Transport Today and Tomorrow: "She's smart, she's dedicated, and she knows the Internet through and through. Thanks to her, our presence and exposure on the Web has increased enormously, with links to all the relevant sites and forums – and public awareness of our activities has grown with it. We get so much more feedback now. The critical Internet scene has come alive for us. We're endlessly grateful to the Porter School and their Internship Program."

Still another intern, **Avi Luvchik**, whose master's studies in the field of geophysics and planetary science involved forecasting the amount of sea salt aerosol in the air, was assigned to the IUED, Israel's foremost environmental advocacy organization. "I worked in the science department, supplying data and models for legal cases and for public awareness campaigns against polluters," he says. The program was well worth a year of his time, he says. "First of all, I learned how to work in an NGO setting – I'd never had any exposure to this before. Second, I learned how to work well in a team, and third, the experience gave me the tools to deal with specific environmental problems, how to go out and talk to the community. Also, I was able to help the NGO. I helped them just like they were helping me."

Additional interns joined the program in its second year. One was **Alison McLernon**, a new immigrant to Israel with a bachelor's degree in Civil Engineering from the University of Edinburgh, who joined the Porter School in 2009. Her thesis centered on changing behavior toward public transportation

Families enjoying the community nature park initiated by master's student Liav Shalem

using the social marketing approach. Therefore her internship at the IUED, where she worked as a research assistant on a project to formulate a plan for reducing greenhouse gas emissions by encouraging the use of public transportation, proved to be especially valuable. When describing her experience, she emphasizes that she both contributed to the advancement of the organization's goals and gained a lot personally: "I learned a lot about the topic I researched and discovered a great interest. Moreover, I learned much about the way an environmental organization works and about forming connections among environmental organizations and with other experts on relevant issues. As a new immigrant, I learned a little about the politics of such organizations and, on top of that, I had the opportunity to attend a Knesset session that discussed the topic I researched – greenhouse gas emissions – an experience that, as a new immigrant, really excited me."

Another intern, Sivan Shalhin, who was assigned to the Dan Municipal Sanitation and Garbage Disposal Association, responsible for waste collection and sanitation in the Greater Tel Aviv area, worked on documenting the transformation of one of Israel's most infamous waste dumps, Hiriya, into a recycling park. The program did not only provide her with "experience in professional writing, conducting interviews, introductions to important figures in the field of solid waste and practical experience" but also led to a job at the Association as an assistant engineer.

Liav Shalem, with a BA in Architecture from the Technion - Israel Institute of Technology began his master's program at the Porter School in 2009. His internship at the Tel Aviv branch of the SPNI, where he helped plan such projects as urban nature sites, gave him "the opportunity to express and integrate the knowledge I accrued in ecology, landscape planning and architecture into the areas the community dealt with at the time. I also gained a lot from understanding the complexity of the contexts in which we work, as well as the importance of the connection to the community in order to preserve the existing open spaces in the city." During his internship, he discovered the importance of networking and educating people, and especially youth, about the importance of open space preservation. At the same time, the internship helped focus his research subject at the Porter School: planning the restoration of a disturbed agricultural area and its transformation into a community nature park.

Noam Zardaz, a doctoral student whose research deals with environmental education, naturally fit into the activities of the Environmental Education Center at Hiriya where he was charged with helping to build the educational model for the Center. Carmel Wisman, a master's student who interned at the Israel Bicycle Association coordinated the Association's "Riding to Work" project, which "aims to promote the bicycle as a safe, efficient and attractive means of transportation to and from work, thereby leading to a behavioral change and rousing awareness to the problem of greenhouse gas emissions." Another doctoral student, Sharon Bar-Lev, worked with the Tel Aviv Municipality to promote green business projects in the city, with special attention to developing a shuttle service from the main train stations to the central business areas on Rothschild Boulevard, where some 15,000 people work. "The project will enable these workers to commute to their place of work in an ecologically-friendly manner by using the shuttles, thus keeping thousands of private vehicles out of the center of Tel Aviv every day," she says. Her contribution and the contribution of other Porter School interns to the municipality, says Ms. Meital Lehavi, then deputy mayor of Tel Aviv-Jaffa, goes beyond advancing green initiatives in the city. It also opens up channels of communication between departments in the municipality that do not normally meet, so that the projects can be approached in a holistic way.

ENVIRONMENT AND REGIONAL SUSTAINABILITY PROGRAM

The environmental partnerships forged by the Porter School aim to improve the environment for residents of the country as well as for residents of the surrounding region. Based on the understanding that the transboundary nature of environmental problems requires an integrated regional approach, the Porter School began collaborating with the Van Leer Jerusalem Institute on regional sustainability projects.

In 2008, a Forum on Environment and Regional Sustainability was set up at the Van Leer Institute, a leading intellectual center for the interdisciplinary study and discussion of issues related to philosophy, society, culture and education. The aim was two-fold: to place environmental issues at the forefront of political negotiations and to promote regional cooperation on environmental and sustainability projects.

To help achieve its ambitious goals, five professional groups, made up of Israelis and Palestinians, were established. One of them was the Israeli-Palestinian Student Forum for Environmental Progress and Regional Sustainability, which began its work in late 2010 with funding from the Leonard Cohen Foundation, under the auspices of the Porter School, the Van Leer Institute and the Palestinian House for Professional Solutions (HPS) of Ramallah. Within this framework, a joint group of about 25 Israeli and Palestinian environment students, mostly graduate level, came together to meet and study cross-border environmental issues in the region. They attended study tours and seminars with environmental professionals, activists, politicians and decision-makers from both sides and exchanged ideas for cooperation and joint research projects on cross-border environmental issues.

The Forum was headed by Dr. Sarah Ozacky-Lazar and coordinated by **Shahar Sadeh**, a doctoral student at the Porter School whose research centers on environmental peacemaking – the possibility of using the environment as a tool for conflict resolution. One of the highlights of the Forum was a tour to Jordan in April 2012. The tour, which included both hikes and lectures, stressed the importance of environmental activity as a vital tool for promoting regional peace. The enthusiastic reactions were best summed up by Monica Dean, a student of the International MA Program at the Porter School, who joined the group and witnessed the growing trust among individuals develop over a period of just four days together. "It was this foundation of trust and friendship that allowed the trip to turn into an opportunity. Through mutual respect, an opening was developed in order to address environmental issues on a regional scale instead of through political boundaries. By drawing attention to the willingness of three nationalities to work together, the empowerment process had begun. The four days were spent learning, traveling and witnessing the interplay between the respective countries. They were also spent building diplomacy that would lead toward mutual cooperation on future environmental projects that can resolve serious environmental deficiencies," she says.

Regional collaboration continued in June 2013, within the framework of a summer program launched by the Porter School in cooperation with Columbia University's Earth Institute and the Columbia Global Center Middle East in Amman. Entitled "Regional Sustainability in the Middle East," the program aims to acquaint students with cross-border environmental problems and opportunities. During the course of the two-week study tour to sites in Israel, Jordan and parts of the West Bank, participants heard diverse perspectives on cross-border environmental issues from academics, NGO representatives, government officials and activists from Israel, Jordan and the Palestinian Authority. They gained first-hand insights on the ways in which environmental

Porter School and Columbia University students during a joint study tour on regional sustainability

"Environmental issues span many academic areas – among them conflict resolution, sustainability management, public health, and international and public affairs – and it was great that the program had people of diverse academic backgrounds working together to reinforce this interdisciplinary breadth."

issues span geographic boundaries, on the impacts of the political conflict on such issues, and on the role that the environment can play in facilitating cooperation and future peace negotiations.

Eliav Shtull-Trauring, a master's student at the Porter School whose research focuses on the water footprint of different agricultural crops in the Jordan Valley, believes that the problems facing the region – such as water shortage, pollution and sewage disposal – are shared ones. He found the program to be an eye-opener for students of both universities. "Interacting with the American students was fascinating because they are committed, caring and interested in the world's complex environmental problems. I believe that it will be up to the younger generation to solve these problems," he says. Other participants shared his feelings. Porter School student Veronika Lacktman, who is especially interested in eco-tourism and cross-border environmental issues, says: "What I learned in a few days was more than I could have hoped to achieve in many hours of work and theoretical studies." And Madeline Silva, a graduate student at Columbia University, was especially impressed by the multidisciplinary dimension of the program: "Environmental issues span many academic areas – among them conflict resolution, sustainability management, public health, and international and public affairs – and it was great that the program had people of diverse academic backgrounds working together to reinforce this interdisciplinary breadth."

The tour was led by Dr. Beth Fisher-Yoshida of Columbia University and by Shahar Sadeh, the academic coordinator of the program who also serves as a fellow at the Earth Institute's Advanced Consortium on Cooperation, Conflict and Complexity. In summing up the experience on the Earth Institute blog, Shahar writes: "The Middle East presents a web of diverse and connected topics, and the complex system becomes more dense with each day as students delve more deeply into topics such as: water purification, desalination, sewage and allocation; nature conservation; tourism; development; culture; religion; scarce resources; overexploitation of ecosystems; agriculture; environmental effects of war and conflicts; cooperation; occupation; and refugees. Students have heard different perspectives on these issues from environmentalists, politicians, teachers, scientists, and government, NGOs, local communities, universities and more. These important, yet sometimes contradictory, viewpoints weave a colorful and passionate story that gets more rich and complex with time."

MAKING CONNECTIONS

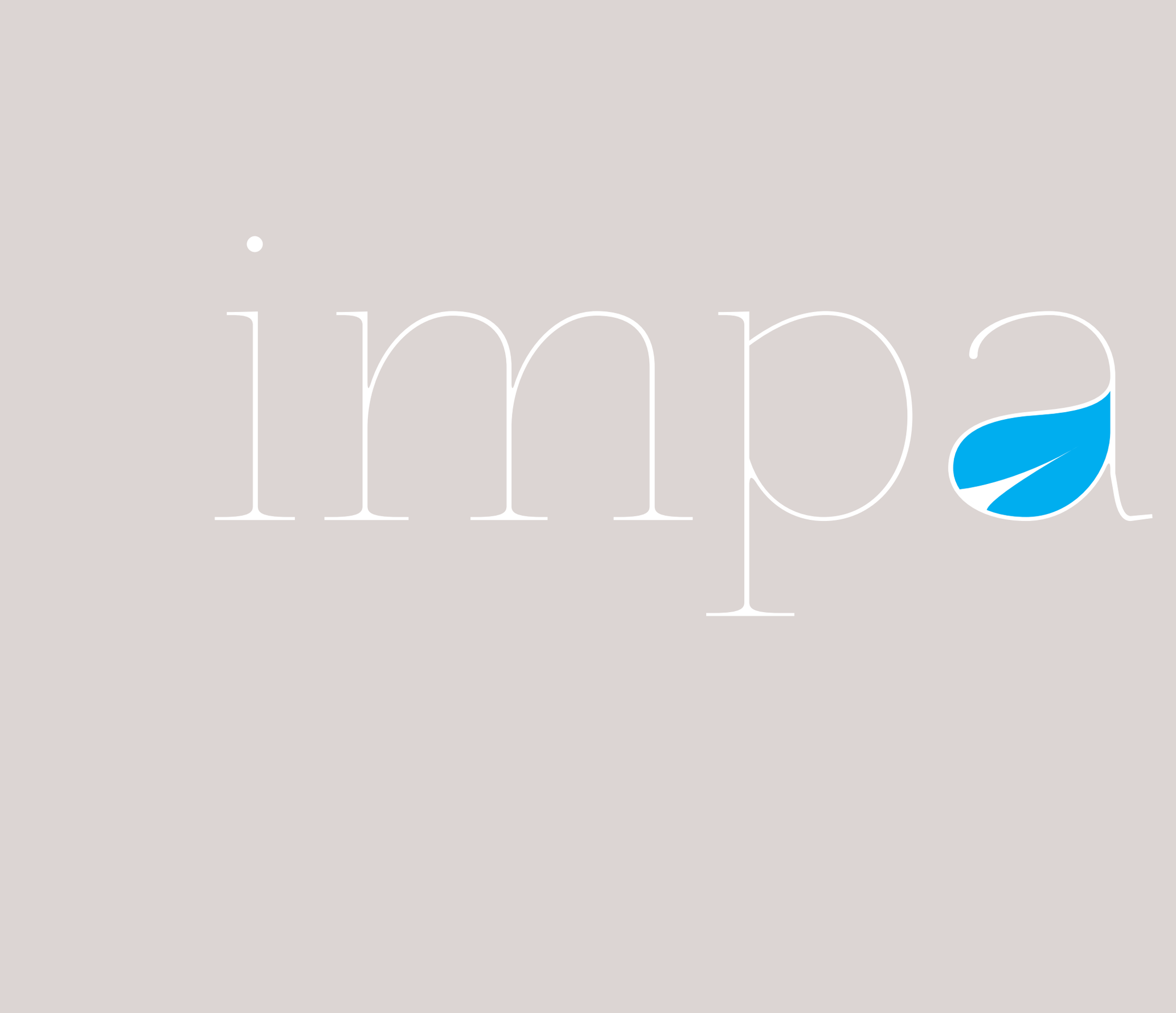
"A university such as Tel Aviv University and a school such as the Porter School, by its very nature, cannot cover all disciplines," says Prof. Hudi Benayahu, the second head of the School. Therefore, forging academic ties and partnerships outside of the university was always of top importance – whether in order to increase the pool of experts that could serve as thesis supervisors to the students, to organize seminars on a wide array of subjects, or to widen the research base by forming consortiums of researchers.

"Partnerships provide a platform for promoting innovation and disseminating environmental information to large and diverse audiences," says Dr. Nesher. "To a large extent, this is what the social networking revolution which is now sweeping the world is all about."

The Porter School remains committed to maintaining and expanding its partnerships with academia, NGOs, industry and government, both in Israel and abroad. Its determination to forge long-term partnerships based on shared interests and a shared vision has led to new initiatives in 2013, both on the national and international fronts, as evidenced by the launch of an 18-month project with the Ministry of Environmental Protection to integrate green building studies in academia and by the collaborative program on regional sustainability in the Middle East which was launched in cooperation with Columbia University.

"Partnerships provide a platform for promoting innovation and disseminating environmental information to large and diverse audiences. To a large extent, this is what the social networking revolution which is now sweeping the world is all about.

8 where are they now?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“A key indicator of the success of a school is to see what its graduates are doing,” says Prof. Messer-Yaron, under whose administration the academic program got underway. “Now that the first doctoral students are graduating, the question is what impact are they making in academia, in industry, in government?”

Hundreds of students take part in the School's academic programs each year. All have the potential to become agents-of-change as they take positions in local and central government, serve as independent environmental consultants, find employment in consulting firms and environmental technology companies, or opt for research careers in academia.

The first graduation ceremony for master's degree students, held in June 2010, was a significant landmark for the Porter School. The first fourteen graduates gathered at Tel Aviv University's botanical gardens to receive their diplomas. One year later, in another milestone, the first five graduates of the doctoral program were granted degrees.

Proud graduates of the Porter School master's program, 2011

A VOICE IN GOVERNMENT

In a country where environmental awareness has been growing at a rapid rate, job opportunities in the fields of environment and sustainability have grown concomitantly. **Yogev Katzir**'s career is a case in point.

Yogev, a master's student at the Porter School, was acquainted with the Ministry of Environmental Protection through a number of consulting projects in which he was involved. When an offer came to serve as assistant to the director general he gladly accepted, knowing that the interdisciplinary knowledge afforded by the Porter School would prove a plus. "When it comes to the environment which is scattered and diffuse, the main challenge is learning how to connect. How can we connect so many disciplines into coherent and practical steps and processes? This is what they do at the Porter School and this is what the Ministry of Environmental Protection does," he says. "There are no separate disciplines at the ministry," he continues. "When consolidating policy, more and more disciplines are involved in initiating processes. This is exactly what happens at the Porter School. Students choose a subject for their thesis and then look at it from the vantage point of different disciplines and viewpoints."

Yogev's master's thesis deals with the use of public-private partnerships to meet the challenges of assimilating innovative environmental technologies in major facilities such as thermal waste treatment facilities. His expertise was perfectly suited to the Ministry of Environmental Protection. "Solid waste management is the point where policy tools and environmental technologies meet," he says. "At the Ministry, an understanding of a wide range of topics was necessary to promote the establishment of a large-scale waste to energy facility in Israel – air pollution, planning and policy, agricultural waste, natural resources, solid waste, economics, science and research. Each of these fields represents a whole, and yet the best decision can only be made when the meeting points between them are discovered." Yogev subsequently moved to the private sector in 2013 to serve as a sustainability strategist at Shikun and Binui, a major infrastructure and real-estate group in Israel.

Michal Goldberg, one of the first students to enroll in the master's program, enjoyed the diversity of students and subjects she encountered at the Porter School. During the preparation of her thesis on the "Uses of Pollutant Release and Transfer Registers (PRTR) as an Environmental Policy Tool for Reducing Industrial Emissions," she interviewed key people at the Ministry of Environmental Protection. In April 2009, she readily accepted an offer to join the legal department of the ministry. While there, she attended Knesset meetings, worked on drafting laws and regulations including the 2010 regulations on effluent quality, and enjoyed a true sense of accomplishment.

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Michal played an important part in promoting legislation which was directly based on the findings of her thesis on PRTR systems in several countries. In fact, the Knesset passed a PRTR law in 2012 which significantly advances the transparency of environmental information in Israel.

When her year was up, she determined to continue to apply her knowledge for the betterment of the environment.

Again, the right opportunity arose. The Knesset was looking for new people to help promote environmental issues. Well-prepared and experienced in both theory and practice, Michal began her work at the Israeli parliament in April 2010. Among many achievements, she played an important part in promoting legislation which was directly based on the findings of her thesis on PRTR systems in several countries. In fact, the Knesset passed a PRTR law in 2012 which significantly advances the transparency of environmental information in Israel. In 2013, Michal moved to a new position which did not previously exist in Israel – legal advisor to the Department of Environmental Health at the Ministry of Health. In her new position, she addresses issues relating to drinking water quality and wastewater quality and reuse while promoting the public health aspects of government initiatives and advancing new and updated legislation.

Dr. Dror Zurel, a marine biologist, first heard about the Porter School from Prof. Benayahu, his thesis advisor. True to the Porter School approach, Dror not only combined two disciplines – microbiology and zoology – in his research on changes in the symbiotic bacterial community of oysters which migrated from the Red Sea to the Mediterranean Sea through the Suez Canal, but dedicated much of his time to a symbiosis of theory and practice. During his doctoral studies he took an active part in an international collaborative project that developed a learning program for the sciences known as DynaLearn, while also developing and tutoring courses in the school system and the university in which students used software to construct marine biology models.

Within three months of completing his doctoral dissertation in 2011, Dror was accepted to the newly established *Mimshak* program, launched by the Israel Society of Ecology and Environmental Sciences for the purpose of enhancing scientific input to environmental decision-making in Israel. Established in cooperation with the Harold Hartog School of Government and Policy at Tel Aviv University and the Israel Academy of Sciences, this fellowship program is targeted at scientists with a PhD degree and post-doctoral researchers in the environmental sciences, equipped with both experience and excellence.

An important goal of the *Mimshak* program is to prepare a cadre of experts and researchers in environmental sciences and ecology, who will be familiar with public policy-making processes and will have the skills to review information from multiple disciplines and to convey it to government officials with little or no scientific training. At the start of the program, Dror was assigned as an environmental advisor to the Planning Administration of the Ministry of the Interior, where he received training in such areas as public policy, government and economics while contributing his expertise toward wise decision-making on environmental issues. At the completion of the program, Dror was offered the position of scientific advisor on planning issues related to the marine and coastal environment, where he played a vital role in providing scientific input to national plans for ports, desalination facilities and oil pumping projects. And, more recently, he took on the position of environmental marine monitoring coordinator at the Ministry of Environmental Protection.

PROMOTING ENVIRONMENTAL ACTION THROUGH NGOS

Dr. Orit Skutelsky, one of the first doctoral students at the Porter School, has always been fascinated by the interrelations between nature protection and human activity. The Porter School "which promotes integrations and combinations and focuses on studies which are more applied" has always been a major advantage, she says. Coming from an academic background in biology and ecology with practical experience in the development of management plans for nature reserves and wetlands such as the Hula Nature Reserve, she believes that more ecological management of agriculture is needed in Israel in order to preserve and conserve the land and its vital ecological services.

In 2011, Orit accepted the position of water and river coordinator at the Nature and Environmental Protection Division of the Society for the Protection of Nature in Israel (SPNI), Israel's veteran environmental NGO. The SPNI has played an important role in spearheading the nature protection movement in Israel, beginning with its struggle against the drying up of the Hula wetland. The position has allowed Orit to combine theory and practice in protecting and rehabilitating the country's scant natural water sources and speaking out against development plans that threaten to adversely impact on the environment. In light of her achievements, she was chosen to be the first representative of the SPNI to light a ceremonial torch during Israel's 64th Independence Day celebrations that focused on the theme of "water as a source of life."

Noam Segal, a PhD candidate at the Porter School has been investigating the social aspects of energy policy, an area not usually studied. "The recognition that energy is not only a natural resource but a social factor, a foundation stone in the shaping of the modern industrial society, can lead to the understanding that the solution to the crisis lies not only in the search for oil substitutes but in a deep and basic social and environmental change," he says. Noam is determined to initiate a new interdisciplinary discourse among senior economists and decision-makers on this subject. It is for this reason that he has helped establish the Israel Energy Forum, an NGO which aims to bring together experts, decision-makers, NGOs, government agencies and other relevant bodies to a joint roundtable in order to promote the implementation of a sustainable energy policy based on energy efficiency, energy independence and increased use of renewables.

Yael Helfman Cohen, whose doctoral thesis focuses on biomimicry as a tool for innovative and sustainable planning, has also used her expertise to found and direct a new NGO – the Israeli Biomimicry Organization. Established in 2009, this organization is dedicated to promoting awareness and knowledge about biomimicry, the multidisciplinary science of

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The development of a biomimetic design method will provide tools to define and transfer biological knowledge to such domains as engineering and technology, bringing about much needed innovation and sustainability.

emulating nature's structures, processes and systems to solve human problems and create more sustainable human technologies and design. With Albert Einstein's quote in mind, "Look deep into nature and then you will understand everything better," Yael has focused her research on identifying and analyzing structural patterns in different biological systems that can serve as the foundation for the development of biomimetic design methods. "The structural patterns are one of the possible bridges to transfer biological knowledge to engineers," she says. Yael presented her research at the Environment 2050 Conference, in which the Porter School took part as an academic partner in 2012, in cooperation with several organizations. She staunchly believes that the development of a biomimetic design method will provide tools to define and transfer biological knowledge to such domains as engineering and technology, bringing about much needed innovation and sustainability.

Tamar Neugarten, whose master's thesis at the Porter School focused on the "Spatial, Social and Perceptual Status of Community Gardens in Tel Aviv," has always been intent on translating her knowledge into practice. She took an active part in the Porter Internship Program where she worked in an agricultural community garden in Bat Yam for Ethiopian immigrants while interning at the Tel Aviv-Jaffa branch of the SPNI. Twenty-four Ethiopian immigrant men from rural backgrounds planned and worked in the garden, growing vegetables used in traditional Ethiopian dishes. The fruits of the project went beyond fulfilling the food needs of the community; they helped restore the sense of self worth of the immigrants by drawing on their experience and expertise. Tamar has gone on to serve as coordinator of Council Watch, a project of the Tel Aviv Center for Environmental Action under the auspices of the SPNI which monitors environmental decision-making in the city council, as well as to serve as the professional director of the Environmental Policy Clinic at Tel Aviv University, a joint initiative of the Porter School and the Department of Public Policy.

Yarden Shani-Rockman, whose master's thesis dealt with the environmental impacts of cooperative networks on the rehabilitation of rivers in Israel, has continued her wide-ranging environmental activities within the framework of several organizations. She served as project and development director of the Green Movement, an NGO established in 2008 to maximize the potential for increased public participation in the democratic process, to promote a social-environmental agenda on the municipal and national levels and to enhance social-environmental awareness among the general public; worked as the education and project coordinator of the Sharon Regional Environmental Unit for the Environment; coordinated the Israeli Forum for the Preservation of Beaches; and lectured on environmental and sustainability issues. She is currently part of the Ecocinema team, an NGO dedicated to increasing environmental awareness in Israel by encouraging Israeli films and organizing annual film festivals on environmental themes.

PROMOTING CORPORATE ENVIRONMENTAL RESPONSIBILITY

Environmental activism has long been central in the life of **Dr. Amitai Or**, a graduate of the Porter doctoral program. Green Course, a nationwide student environmental organization founded in the late 1990s, fitted his ideology. "People looked at me cross-eyed when they heard about my environmental activism," he remembers. "After all, defense and economic development were top priority issues with both politicians and the general public at the time. The environment was esoteric." The turning point, "in which suddenly something that was once esoteric became mainstream," he says, may well have been Al Gore's film, "An Inconvenient Truth," which was released in 2006. Significantly, this was the time that the Porter School's academic programs received their official go-ahead, enabling Amitai to embark on his graduate environmental studies.

Amitai has always sought to link research and practice, ecology and industry. Terms such as industrial eco-efficiency, biomimicry, material flows, environmental management and environmental technology were integral to his vocabulary. Therefore, while profiling the microbial community of the Yarkon River in Israel, he remained equally committed to Israel's environmental organizations community – coordinating Green Course activities at Tel Aviv University, serving as a member of the executive committee of Life and Environment, the umbrella organization for environmental NGOs in Israel, coordinating environmental and public health activities at the Tel Aviv branch of the SPNI, and serving as a teaching and research assistant at the Porter School. His environmental interests extended to the industrial community as well and during his doctoral studies he served as a consultant to environmental companies and projects on environmental, health, safety and quality (EHSQ) issues, especially in relation to International Organization for Standardization (ISO) guidelines on environmental management systems. As the Corporate Responsibility Manager of Shikun and Binui, Amitai's interest in promoting sustainability and environmental corporate responsibility continues.

Idit Alhasid, a doctoral candidate at the Porter School, specializes in community empowerment and has spearheaded numerous national and local environmental projects focusing on education and community awareness. With a rich academic background in ethnic, political, environmental and social management together with extensive experience in educational and environmental work both within the formal and informal frameworks, Idit formed a new company in 1999 – "Community - Creating a Green Society." The company specializes in developing social and environmental action plans for companies and organizations, developing a green organizational culture, managing environmental education projects and more. Additionally, she has played a key role in creating and directing the Center for Environmental Education in Hiriya, a major recycling park in the center of the country.

Shahar Rozalis, whose master's thesis related to predicting flash floods in a Mediterranean climate using a hydrological model, is dedicated to promoting environmental education and awareness. After working at the Sharon Regional Environmental Unit, she founded and serves as the content consultant to the

Graduates have often found their way to Israel's leading environmental companies and organizations – whether government ministries, municipal or regional environmental units, environmental technology companies or consulting firms.

Green Circus, an organization dedicated to experiential environmental education for schoolchildren and adults, in which circus performances, music and play are used to inculcate environmental education values and promote sustainability, reuse and recycling.

Several Porter School graduates have found positions in Israel's major environmental consulting firms such as DHV MED Ltd., which provides consulting engineering services in water, environment and related infrastructure. Itai Perry, for example, who directs the environmental consulting department, deals with the gamut of environmental issues – air and water pollution, industrial emissions, contaminated land, waste, natural resource management and environmental regulation. His interdisciplinary academic background at the Porter School provided him with the wide base of knowledge necessary to deal with all of these subjects while his thesis, which focused on river rehabilitation and the management of water and natural resources, has equipped him with the necessary expertise to spearhead activities in this area.

Similarly, Efrat Katz, another graduate of the Porter School master's program, began her career as an independent consultant to NGOs and government, going on to serve as a senior environmental expert and project manager at DHV MED Ltd., specializing in economic, law and environmental policy. Her master's thesis focused on the link between environmental regulation and the industrial use of PRTR systems in Canada and Australia, and she has partnered in such major projects as the establishment of a PRTR for Israel, formulating an environmental permitting policy for industry in Israel, and more. Her expertise lies in shaping environmental policy and legislation and conducting cost/benefit analysis for the implementation of environmental policy.

Daniel Ben Yehuda, whose master's studies focused on eco-innovation and technology transfer to developing countries, is the community and capacity building coordinator of the Innovation and International Development Program at the Hartog School of Government and Policy, a "practical think tank" at Tel Aviv University working with the Israeli government, private sector and NGOs to create national level policy reforms. The program aims to promote policy conducive to the creation of an industry in Israel dedicated to providing innovative solutions to global challenges. Daniel is also co-founder of DevTechHub, a social venture that aims to implement technology to meet the needs of developing countries. In both positions, he leads the creation of a community network of activists, entrepreneurs, start-ups and business and civil society organizations dedicated to international development.

Ms. Elia Yair, the Porter School's dedicated graduate student secretary who has accompanied the master's students along every step of their way, is proud that so many students and graduates have found employment in their fields of expertise. She points out that networks have developed among Porter School students and alumni and that graduates have often found their way to Israel's leading environmental companies and organizations – whether government ministries, municipal or regional environmental units, environmental technology companies or consulting firms looking for suitable candidates to head environmental projects or promote corporate responsibility. With their rich multidisciplinary background accompanied by practical experience, many of the Porter School graduates prove to be perfect candidates for these positions.

GREENING THE ISRAEL DEFENSE FORCES

Lt. Col. Eli Paz, a graduate of the Porter doctoral program, is a success story unto himself. A diving instructor with a master's degree in business administration, he has had a major impact on greening the Israel Defense Forces (IDF). The process began in the wake of major criticism of the IDF's lack of environmental management from the Ministry of Environmental Protection, from the State Comptroller and from soldiers themselves in the mid-2000s. Within a few years, a new Environmental Protection Division was created within the framework of the Technology and Logistics Branch of the IDF to tackle the environmental hazards, and Lt. Col. Paz was chosen to turn vision into reality.

"I wanted to make an impact," he says. "But in order to do so I felt I had to pursue doctoral studies on the environment within the framework of the Porter School." The combination of theory and practice worked well. The processes initiated by the IDF's Environmental Protection Division have made a major difference in the quality of the environment in Israel. Soon after his appointment, Lt. Col. Paz initiated a major study on environmental protection methods in militaries around the world and set up an environmental protection school to train commanders and non-commissioned officers. A major budgetary allocation in 2009 enabled a multiannual program to be drawn up to prevent future pollution, to promote resource efficiency and to increase environmental awareness.

The results of the "IDF Protects the Environment" program are tangible: a major drop in water use and gasoline consumption, the connection of army bases to sewage facilities, the treatment of oil and gasoline leaks, the introduction of pollution prevention equipment. Today, says Lt. Col. Paz who recently completed his service as head of the IDF's environmental division, all military activities in the army, including construction and exercises, take account of environmental considerations. "The IDF is turning into a green army," he concludes. "The idea is to form another culture, to change the worldview of the military. Doing so is a process, but we're definitely moving in the right direction."

"The IDF is turning into a green army. The idea is to form another culture, to change the worldview of the military. Doing so is a process, but we're definitely moving in the right direction."

EXPANDING SCHOLARLY RESEARCH IN ACADEMIA

The quest for excellence often leads Porter School doctoral students to pursue their post-doctoral studies at prestigious institutions throughout the world.

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Dr. Karin Ardon-Dryer, whose PhD thesis at the Porter School focused on cloud physics, continued her post-doctoral studies at the Massachusetts Institute of Technology (MIT) in Cambridge, Massachusetts. After studying the earth in her first and second-degree studies, she says, "I decided to move up to the skies and study cloud physics at the Porter School at Tel Aviv University." At MIT, she is conducting her post-doctoral work at the Department of Earth, Atmospheric and Planetary Sciences (EAPS), a department that applies "fundamental scientific principles across traditional borders, leading to rich interdisciplinary collaborations and programs of study."

Dr. Yuval Reuveni, another graduate of the doctoral program and recipient of the 2007 Porter School research grant for excellence, is pursuing his post-doctoral work at the Geodynamics and Space Geodesy Group at the Jet Propulsion Laboratory at NASA.

Shahar Sadeh, a doctoral candidate who is researching different issues related to environmental peacemaking and who coordinated the Forum on Environment and Regional Sustainability at the Van Leer Jerusalem Institute, went on to be a visiting scholar at the Advanced Consortium on Cooperation, Conflict and Complexity (AC4) at the Earth Institute at Columbia University. Her special interest lies in peace parks as tools for environmental peacemaking and she continues to investigate ways of creating spaces for cooperation which abolish physical borders and bring people and natural life together. In 2013, she served as the academic coordinator of the Regional Environmental Sustainability in the Middle East fieldwork course, a joint project of Columbia University and the Porter School.

Elad Persov is working toward his doctoral degree in the field of design management at the Porter School while coordinating the master's level design management program at the Bezalel Academy of Art and Design. His research examines the link between product design and business, and his research assumption is that "design managers have the potential to be the environment's ambassadors at one of the most critical crossroads in the new product/brand/service development process." Meanwhile, he is responsible for the field of sustainability at the Bezalel Academy and continues to impact on dozens of graduates of the design management program each year.

PORTER STUDENTS ON BEHALF OF THE ENVIRONMENT

Environmental activism and participation are in the DNA of Porter School students. Many of them may be found on GreenChange, an online social network, established by the Heschel Center, with the goal of creating an online environment where environmentalists can meet, share ideas and information, and promote a sustainable society. Within Tel Aviv University itself, they are committed to greening the campus. Some, like Gilad Ronen, may be found tending the ecological garden on campus. Others, like Adi Shapira, are involved with the Renewable Energy Center. Still others, like **Hofit Itzhak Ben Shalom** are evaluating the Porter School Building.

"The Porter School is a flagship of how you take people with a rich academic and research background and export them to the real world, so that they will not only write but will implement and advance projects in the field of the environment," says Yogev Katzir. "As the circle widens, the impact will grow. The more graduates, the better the environment."

"Today's graduates have little difficulty in finding a job, especially as environmental advisors," says Dr. Nesher. "In the future, growing regulatory requirements, born of Israel's newly enacted legislation in such fields as recycling or PRTRs and its acceptance into the Organization for Economic Cooperation and Development (OECD), will further increase the demand for environmental experts in industry. Porter School graduates, with their expertise in a wide range of environmental fields, are especially well poised to serve as sustainability officers in companies throughout Israel. For its part, the Porter School will continue to adapt itself to market needs, on the one hand, while leading the market in innovation, on the other. As Israeli industry internalizes the fact that environmental regulation is an opportunity rather than a constraint, prospects for new environmental positions in a wide range of areas will grow concomitantly."

The Porter School is committed to further opening the graduate job market through its alumni association and through the development of environmental job fairs, Dr. Nesher continues. And, the advancement of the second stage of the Porter School Building project, which envisions the establishment of an environmental technologies center, will provide additional opportunities for rising to the challenge.

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Environmental activism and participation are in the DNA of Porter School students

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the porter school building


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The Porter School of Environmental Studies has been a school without a permanent home since it was founded. Beginning in modest offices on the ninth floor of the Sackler Faculty of Medicine Building, it moved to the Gilman Humanities Building in 2007 from where it has successfully run its wide range of academic, research and community outreach programs.

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But the dream of a building of its own that would reflect its essence and its mission was never abandoned. In fact, a green building that would be an inspiration to all was intrinsic to the vision of Dame Shirley from the very start.

In 2014, the dream was fulfilled with the completion of one of the Porter School's most ambitious projects: the construction of a green building – popularly known as "The Capsule Building" for the prominent feature of its southern façade: a unique architectural element, serving both as a meeting room and an "ecological beacon" presenting environmental data on a network of LED bulbs that face the Ayalon freeway. The inspiration, says Dr. Nesher, an avid proponent of the idea from its very beginnings, came from the Adam Lewis Center for Environmental Studies at Oberlin College in Ohio. The vision for what was described by the New York Times as "the most remarkable of a new generation of college buildings" and by the US Department of Energy as one of the thirty "milestone" buildings of the 20th century, was spearheaded by Prof. David Orr, chairman of Oberlin's environmental studies program. His expertise also helped promote knowledge about green architecture in Israel when he appeared as the keynote speaker in a Greening Academia Conference convened by the Porter School in December 2008. While more than a decade separates the two buildings, hopes are high that the Porter School Building too will be a "milestone," significantly raising the bar for green building standards in Israel and providing a dedicated space for environmental research and for the demonstration of environmental technologies.

Prof. Itamar Rabinovich recalls that the construction of a green building was a prerequisite for Dame Shirley. In fact, the original contract between the Porter Foundation and Tel Aviv University, signed in November 2000, linked the two objectives.

The allocation of land for the building site had already been completed during the term of Prof. Yoram Dinstein, president of Tel Aviv University from 1991 to 1998. "We said the location had to be symbolic and we looked for a place that would embody the spirit of the School," says Dr. Nesher. "The president of the university was receptive to the concept, supportive and enthusiastic – and also had the perfect location in mind," recalls Dame Shirley. "We walked to the highest point at the university, a large parking lot built on top of an expanse of landfill dumped there from previous construction on the campus." The Porter School saw the potential of this piece of land overlooking the Ayalon freeway and accepted the offer.

COMMITTEES AND COMPETITIONS: THE FIRST ROUND

Once the contract was signed, a building committee under the leadership of then deputy rector of the university, Prof. Shimon Yankielowicz, began the painstaking process of planning for the green building. Hard decisions had to be taken. What laboratories to include in the building? Which green technologies to install? A decision was taken to include eleven to twelve laboratories, representing the various environmental disciplines at the university and connected to existing researchers at specific faculties. However, since the researchers were to belong to their individual disciplinary faculties, complex questions lingered concerning their integration in the laboratories. The age-old dilemma of breaking through the academic barriers of disciplinary faculties remained.

Nevertheless, plans forged ahead. In 2003, the university launched an invited international competition for the construction of the green building. Six leading international architects, all widely recognized for their sustainable architecture, submitted their design proposals. They included Enrique Brown of Chile, Ken Yeang of Malasia, Mario Cuccinella Architects of Italy, Paul Katz (KPF) of the USA, Peter Hubner of Germany and Troppo Architects of Australia. All were accompanied by their environmental advisors on their mission to Israel. In the first stage, a technical committee, comprised of experts on water, energy, acoustics, landscape and other key areas, reviewed the submissions and short-listed three. Evaluations by Tel Aviv University decision-makers and by the Porter Foundation followed in the second stage. During the final stage, which took place on January 12, 2003, an impartial jury led by Architect Ulrik Plessner evaluated the three designs and chose Troppo Architects as the winners, based on their innovative design and pioneering use of photovoltaic cells for both energy production and shading. In August 2003, Troppo Architects visited the Porter School, meeting with experts and consultants, and plans got underway to formulate the relationship between the Israeli and Australian teams in order to advance the process.

Dame Shirley and the late Sir Leslie Porter at the first cornerstone-laying ceremony for the Porter School Building, 2000

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In parallel to the international competition and in recognition of green building as a top priority subject, the Porter School also launched a final project competition on the design of the green building among students of the Studio on Green Architecture at the Azrieli School of Architecture. The awards ceremony took place in January 2003, with the participation of (the late) Prof. Sara Fine, the donor of the awards, as well as other dignitaries from the Porter Foundation and the university. The first placed student, Dany Zalishanski, later joined Troppo's architectural team in Australia to take part in the planning and building process.

But it was not to be. Political and economic times were hard in Israel. The main obstacle, says Prof. Rabinovich, was the timing. Plans were forwarded during what Prof. Rabinovich calls the "lost decade of higher education" in Israel. The Second Intifada was raging, the Internet bubble burst, budgets were slashed. "Building a spectacular building was difficult and getting the matching funds from the university or from the Planning and Budgeting Committee of the Council for Higher Education was impossible," he says. A moratorium was placed on all construction.

During the tenure of the second head of the School, Prof. Messer-Yaron, Tel Aviv University Director General Gidon Langholtz set up another building committee. The recommendation this time was to erect a joint Porter School-Life Sciences building, with separate and joint spaces for the two entities. It was also decided to contract an Israeli architect to carry out the work and to integrate environmental technologies into the Porter School space. However, fundamental questions remained. How could the School encourage new areas of innovation and introduce new laboratories in innovative fields? How could the School sustain itself and maintain its independence if it remained dependent upon researchers from other faculties?

While the questions were not resolved, the building committee submitted its report to the Planning and Budgeting Committee of the Higher Education Council. The response, received in August 2006, was that dedicated funds could not be allocated to the Porter School. The donors and the university were advised to plan the building based on available funds.

To advance the building, ways were sought to minimize costs. The number of square meters of building was reduced from 3,400 to fewer than 1,500, and the construction of laboratories was postponed to a second phase. On January 24, 2008, a contract incorporating the changes was signed between the Porter Foundation and Tel Aviv University for construction of the building.

GROWING CONSCIOUSNESS OF GREEN BUILDING IN ISRAEL

Throughout the ups and downs that delayed the construction of the LEED building, the Porter School spared no effort to promote sustainable building knowledge in Israel. In addition to pioneering academic programs, in cooperation with the Azrieli School of Architecture at Tel Aviv University, it helped found the Israel Green Building Council in 2007, and it continues to cooperate with the Council through joint research projects, events and workshops. It organized conferences on building and urban sustainability in partnership with academia, government ministries and professional, social and environmental organizations. It focused major efforts on training professionals from different backgrounds on green building, *inter alia* through a course entitled Green Building & Business Opportunities coordinated by Dr. Nesher and organized through LAHAV – Executive Education at the Faculty of Management. In 2012, it won a tender together with the Green Building Council and the Heschel Center to train planners at the Ministry of the Interior and the Ministry of Environmental Protection on urban sustainability and green building.

In 2013, the Porter School was a leading academic partner in the Israeli team selected to represent Israel in the Solar Decathlon China 2013 competition – an international competition with 54 countries represented which challenges twenty collegiate student teams to design, build and operate solar-powered houses that are net zero energy buildings and are affordable, energy-efficient and attractive. The Israeli team, made up of some thirty students from the Porter School, the Shenkar College of Engineering and Design, the College of Management Academic Studies and the Neri Bloomfield School of Design and Education, and supervised by Dr. Joseph Cory and Architect Chen Shalita, took second place in the architecture competition and fourth place overall. They designed a four-room, modern, decorated home that thrives on solar

Design of the Israeli team at the Solar Decathlon China 2013 competition

energy, reusable gray water, a solar-thermal heating system, windows paned with photovoltaic cells and an external skeleton that can be disassembled and reassembled with ease. Their design was based on a Mediterranean "4-Room Israelite House," an ancient building archetype found in archaeological remains in the region from about 3,500 years ago. "This house proves that green is economic – really affordable housing – in the latest sense of the word," says Dr. Cory, a Shenkar College faculty member who is a member of the design team for the Porter School Building.

Other developments proved pivotal in helping to advance the subject of green building on the national level. Israel's first voluntary standard on green building, Israel Standard 5281, was published by the Standards Institution of Israel in November 2005, and a standard on the energy rating of residential and office buildings was approved that same year. And, in 2011, catalyzed by the Ministry of Environmental Protection, a revised green building standard was approved in the wake of consultations with all stakeholders, including the Porter School, government ministries and the Green Building Council. The new standard, with five quality levels ranging from one to five stars, relates to nine fields: energy, land, water, building materials, health and welfare, waste, transport, construction site management and innovation.

Construction of the Porter School Building sparks the interest of international green building and sustainability experts

Further progress came in the wake of the Copenhagen Climate Change Conference in December 2009 when Israel committed to reducing its greenhouse gas emissions by 20% by 2020 in comparison to business as usual. In November 2010, the government approved a ten-year national plan for greenhouse gas emissions reduction which allocates some $600 million for a wide range of greenhouse gas abatement measures, including green building. An important element in the national plan was a subsidy program, jointly administered by the Ministry of Environmental Protection and the Ministry of Economy, to support greenhouse gas mitigation projects. Within the framework of a call for projects that can deliver quantified reductions in greenhouse gas emissions until at least 2020, the Porter School won approval for its project to install air conditioning technologies based on thermo-solar energy in its new building.

Finally, in recognition of the importance of academic education and training to promote green building, the Porter School and the Institute for Business, Environment and Society at Tel Aviv University received a go-ahead in December 2012 to cooperate with the Ministry of Environmental Protection on a project aimed at integrating green building studies in academia. The project calls for a host of initiatives – including the development of graduate courses on green building, the organization of conferences and workshops, and even the launching of an annual national competition on green building. The Porter School Building will play an essential function in the project. It will be used as a demonstration center for green building in practice and will serve as a case study for comparison between the Israeli green building standard and the LEED standard under Israeli conditions for the purpose of re-evaluating and possibly upgrading the Israeli standard.

The Capsule meeting room

MOVING TOWARD THE GOAL: THE SECOND COMPETITION

As awareness of green building increased in Israel and a new cadre of Israeli architects began to emerge, the Porter School set out to implement the contract signed with Tel Aviv University. The time had come for the School to make its physical mark on the environmental history of Israel: construction of what is hoped to be the first building in Israel to qualify for the LEED Platinum status – the highest accreditation of the Leadership in Energy and Environmental Design rating system, developed by the US Green Building Council (USGBC).

Aiming to find the best Israeli architects for the unique challenges of the project, the Porter School invited the community of architects in Israel to present their candidacy for the design of a building, which would "respond to sustainable planning principles, integrate 'green' technologies, and serve as a 'laboratory' for environmental studies. Threshold criteria included experience in the design of public buildings and practical experience in 'green building.'" On March 23, 2008, thirty-nine leading companies presented their candidacy. In May 2008, the selection committee, headed by Architect Danny Kaiser and including professionals and representatives of Tel Aviv University, the Porter School and the Porter Foundation, opted to open the field to young Israeli architects and shortlisted seven teams. The finalists were asked to prepare detailed models of their architectural concepts that would respond to the high criteria set by the School. They were also asked to present a list of the advisors who would accompany them throughout the planning and design process. The criteria were challenging. The architects were asked to plan a four to six story building that would concentrate the multidisciplinary academic activity of the School under one roof, provide a meeting ground for researchers, students, environmental organizations and government ministries, host conferences and seminars, and house research institutes. They were asked to design a "green building" which would serve, in and of itself, as a laboratory for studying environmental technologies, utilize the conditions of the surrounding environment, and include green systems for both research and education – wastewater treatment and reuse, energy production and energy savings based on photovoltaic cells, natural ventilation and bioclimatic design. They were also asked to design a building that would meet the highest quality level of the Israeli Green Building Standard (5281) and satisfy the requirements for LEED certification by the USGBC, with the hope of attaining Platinum status.

The submissions were groundbreaking, and the decision-making process was difficult. At the end of the day, the selection committee opted for a team of young Israeli architects whose model highlighted the Porter School Building as an urban icon, visible to all. The winning team was made up of three firms – Axelrod Grobman Architects (Irit Axelrod & Dr. Yasha Grobman), Geotectura (Dr. Joseph Cory) and Chen Architects (Nili & Nir Chen). Young in age and





Building Architects: Irit Axelrod, Dr. Yasha Grobman, Dr. Joseph Cory, Nili & Nir Chen.



Landscape Architects: Ruth Maoz and Alisa Braudo

spirit, combining academic research with teaching and practical experience, they best embodied the vision of the building committee and of Dame Shirley herself. Together, they combined the artistic ability, technological know-how, architectural expertise and environmental values necessary to design Israel's greenest building.

Dr. Joseph Cory recalls that the team members recognized that they were taking part in something historic. They realized that the Porter Building would be much more than an innovative structure. It was to be a trailblazer in Israel. "Throughout the world, voluntary standards for green building were consolidated, but for Dame Shirley, designing the greenest building in the world was an obligation. You had no choice – you had to be the best."

Dr. Yasha Grobman, who combines research and academic teaching with practice in order to advance the architectural discourse, remembers the decision of the team to present a design in the second stage of the competition that would go far beyond mainstream sustainability. The team competed against leading Israeli architects who included sustainable elements and environmental technologies in their proposals. "We, however, showed how sustainability is linked not only to the environment but to the economy and society as well, and we managed to do this in an educational way. The final design made a strong visual statement," he says. "The idea," says Dr. Cory, "was to construct a vertical, living museum for all to see."

"It's a very great challenge," says Dr. Grobman, "but that's exactly why we entered the competition in the first place. The Porter School asked us to create a veritable model of urban sustainability: a building that maximizes the natural energy resources of its location, such as sunlight and wind, and features inventive technologies for saving and producing energy, as well as recycling water and wastes. We put a great deal of thought and effort into this project and winning is a great honor for us."

The complexity and innovation of the landmark project required extensive knowledge, advanced tools and close teamwork from the earliest stages of planning. Therefore, the lead architectural team was joined by other crucial players: Ruth Maoz, Alisa Braudo and Shlomit Zilberman of Braudo-Maoz Landscape Architecture Ltd., Assa Aharoni Consulting Engineering Ltd., Avivi Axelrod Engineers Ltd. and the Baran Engineering Group, in charge of construction. The team was also assisted by leading consultants and experts, both Israeli and foreign, including Guy Battle – a UK construction and environmental engineer, who specializes in planning environmental buildings with low energy emissions. The vast collaborative effort generated a process of environmental planning which was fully transparent, fulfilling one of the major educational aims of the Porter School – developing Israeli know-how on green building which would be available to all.

"We took the best consultants since nobody in Israel had built a green building at the LEED Platinum standard," says Dr. Nesher. "They were integrated into the team. We worked with the Green Building Council and with the consultants from the very start of the planning process rather than at a later stage in order to inform the process from the outset. And it was a unique undertaking – the consultants were re-educated throughout the design process and their experience will, in turn, re-educate others in Israel about the best in green building and design."

The expertise and dedication brought by each of the three architectural firms – whether experience in the construction of educational buildings, digitalization, or sustainable design – proved vital. Moreover, the consultants on such subjects as landscape architecture, construction engineering, electricity and ecology worked in close collaboration with the architects throughout the process, with Roy Kroizman of the School staff coordinating the logistics.

Presenting the building plans with director general of the university Mordehai Kohn, March, 2009

Sign unveiling, March 2011

Dame Shirley and the Porter family with Environmental Protection Minister Amir Peretz at the mezuzah affixing ceremony, March 2014

The Porter family at the signing of the certificate later placed in the building cornerstone, May 2011

Cornerstone laying, December 2011

The Porter family with MK Isaac Herzog and Tel Aviv-Jaffa Mayor Ron Huldai at the ribbon-cutting ceremony, May 2014

THE VISION OF THE PORTER SCHOOL BUILDING

"Great architecture can be made more easily when we have great clients with a vision. The vision of Dame Shirley included, right from the start, the need for a sustainable building to host all of the research activities," says Dr. Cory.

The architectural team that designed the building shared the passion of both Dame Shirley and Dr. Nesher for designing a structure that would constitute a new benchmark in sustainable building in Israel. They were challenged by the vision of designing a building that would, in the words of Dame Shirley, "stand as a symbol for Israel's desire to better the environment."

As the Porter School's permanent home, the building was designed to concentrate the interdisciplinary activities of the School under one roof, creating a fertile platform for advanced environment-related research and education. However, the building was to be much more than a physical home for the School's activities. It was to form a living scientific laboratory, continuously testing, demonstrating and disseminating the fruits of environmental research and serving as a platform for pioneering ideas and innovative environmental technologies.

The vision called for maximizing the educational potential in every aspect of the building's design and operation. Environmental technologies were not only to function as planned, but were also to educate those using the building about their operation. The building was not only to house researchers working in different fields, but was also to be an object of research in areas such as sustainable design and environmental education. Students were not only to

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The Atrium

Cultivating plants on the green roof

study within the walls of the building, but were also to investigate how the building itself operates, to evaluate its design and to monitor the effects of its environmental technologies. Visitors were not only to be welcomed to the open building, but were also to be introduced to the wide range of green systems used by the building, such as air conditioning based on thermal and solar energy, natural ventilation and advanced bioclimatic (passive) planning, biological wastewater treatment using constructed wetlands, and measurement and control systems. And the building was not only to comply with the most stringent requirements of Israeli green construction and the LEED standard, but was also to provide an opportunity to compare the two standards under Israeli conditions.

"We greatly admire the Porter School for its vision and initiative, and are grateful for this opportunity to build an architect's green dream," concludes Dr. Cory. "We believe that this building will be a beacon, bringing the environmental message to everyone: the business community, government agencies, the academic world, planners and architects, and the entire Israeli public. It offers indisputable proof that in the long run, building green is building smart."

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THE "CAPSULE BUILDING": COMBINING FORM AND CONTENT

From the start, the environmental parameters and conditions around the site, including solar radiation, wind velocities and directions, acoustics and more, dictated both the form that the building would take and its position on the site. One of the first goals was to transform the 0.15-hectare parking lot with heaps of construction waste underneath it into a healthy environment. Therefore, major care was taken to make the building process itself clean and sustainable, while reusing excavated soil and used and recycled materials. At the same time, the Porter School elected to document and photograph all stages of the construction process while enabling live broadcasting from the site on its website.

The question of how to best reflect the essence and vision of the School was answered by the EcoWall, the singularly striking southern façade of the building. "The EcoWall was essentially planned as an ecological laboratory for experiments that require exposure to outside conditions," explains Dr. Grobman. "It consists of 16 small balconies or rooms, where researchers could conduct studies on plants, photovoltaic cells, water recycling and other environmental subjects, or where research findings and new technologies could be presented. But it also serves another function: visitors, from international experts to Israeli schoolchildren, will be able to view the experiments, information and technologies from inside the building, through the glass wall. In fact, the EcoWall is a kind of educational showcase, inviting the public to learn about the scientific work and become involved in the environmental cause."

The norm in academic settings is for every researcher to be closed in his own room, invisible to those around him. This goes against the grain of the Porter School spirit where interdisciplinary cooperation is a motto. This spirit, says Dr. Grobman, inspired the idea to design a building that beckons participation and displays research findings and the testing of new technologies by leading companies. The glass research and display cubes, known as EcoPods, embody the philosophy of transparency, openness and visibility that characterizes the School. At the same time, solar vacuum tubes hanging on the EcoWall absorb the sun's rays and heat the water which powers the building's climatic systems while shading the building from the southern sun.

"At the center of this façade," says Dr. Grobman, "we added a disturbance, a beauty mark, in the form of what we call the Capsule Meeting Room." This visually-striking, spaceship-like structure suspended over the building's atrium, which gives the building its popular name, is used for meetings, seminars and workshops while its outer layers are covered with a computer-controlled network of LED bulbs, enabling the public display of environmental information such as pollution levels in Tel Aviv. Thus the EcoWall responds to the challenge of minimizing the acoustic and air pollution from the freeway while capitalizing on the fact that over 350,000 people see the building while driving along the freeway each day.

In terms of design, the dynamic form of the building is created by the tension between two unique elements – the EcoWall, planned as an ethereal lattice and the central mass of key building functions designed as an opaque body "floating" above ground level. Between these two structures, the atrium, a soaring, glassed-in lobby and exhibition space with a three-story high foyer, serves as the main thoroughfare of the building, where events and exhibitions are held. The multi-purpose, 300 square meter open space features monitors displaying online data on the building's energy, carbon and water consumption data, as well as novel environmental research findings while offering breathtaking views of Tel Aviv and beyond which can be enjoyed over a cup of coffee or a meal at the café/restaurant.

The emphasis on public space within the building, says Dr. Grobman, reinforces the social pillar of sustainability by enabling researchers, students and the general public to walk through the building, meet, interact and exchange ideas in an informal setting. "The building plays on the relationship

A momentous occasion: installing the "capsule" on the EcoWall

between private and public," he says. "It is well-packaged and minimalist in terms of rooms while providing a large expanse of public space, which, after all, is the place where collaborative ideas are born."

And, of course, green systems and technologies are central to the building. Computational Fluid Dynamics (CFD) was used to model airflows and temperature in order to provide optimal thermal comfort in the building. Solar vacuum tubes heat water to operate the climatic systems. Windows are angled in such a way as to allow optimal natural wind circulation. Warm air is funneled out of the building through special evacuation pipes. A green roof provides thermal insulation throughout the year. Three shaded biological pools at the front of the building serve as constructed wetlands for the treatment and recycling of the building's gray water, which is reused to irrigate the indigenous vegetation in the ecological garden and the green roof. And facilities for the separation of waste at source are integrated into the building to ensure waste recycling.

MOVING TOWARD THE SECOND PHASE

At the time of the 2008 building competition, the Porter Foundation postponed the construction of laboratories to a later phase due to lack of funds. It concentrated instead on providing a physical home for the Porter School that would incorporate the necessary teaching and research areas for students as well as the necessary space for conferences, exhibitions and meetings which form an integral part of the School's outreach and educational mission.

With the completion of the Porter School Building, the School is making plans for the second phase of its building project. Preliminary plans call for a 2,500 square meter structure adjacent to the "Capsule Building," with a possibility for further expansion in the future. The laboratory building will utilize sophisticated design techniques as well to minimize energy consumption and reduce its impact on the environment. Its unique location, inside the cliff and on top of the east slope, will contribute to a thermal comfort zone inside the building, while geothermal techniques along with wind cooling will help reach the energy goal of a passive building.

While in the early years of the Porter School, plans for the green building called for the establishment of laboratories for specific researchers in the university, the experience accumulated in the intervening years led to a new conception. "As the Porter School continued to mature, evolve and develop," says Dr. Nesher, "the recognition set in that the School needs its own researchers and faculty members to accomplish its goals in addition to its partnerships with other faculties." More and more, the School recognized the critical need of young researchers for laboratory space in which to carry out experiments in innovative environmental fields. It recognized the potential of the laboratory building to attract a core group of leading scientists to the Porter School, thus strengthening both the School and the university itself. The idea of "flexible laboratories" was born.

Plans call for the establishment of 13 or 14 laboratories equipped with state-of-the-art scientific equipment, which will be flexible both in terms of providing possibilities for research in different fields and scientific disciplines and in terms of collaborative use by the researchers themselves. The idea is for laboratory space to be "leased" to specific researchers based on fund availability and for the duration of time in which the researcher actively works on the project.

In formulating the vision for the laboratory building, the Porter School examined a new model whereby major corporations have begun to establish research and technology centers on university campuses in different parts of the world, based on their potential to attract the best of scientists to carry out cutting-edge research in state-of-the art laboratories. The Advanced Energy Research and Technology Center (AERTC), which is housed in a Platinum LEED-certified building at Stony Brook University in New York is a notable example. It is a partnership of academia, research and industry whose mission is innovative energy research, education and technology funded by both the state and industry.

In line with this model, the Porter School envisions the establishment of an environmental technologies center of excellence, with the support of government and leading corporations in Israel or abroad. Housed in the new building, such a clean-tech center could significantly bolster the innovative, forward-thinking interdisciplinary research performed at both the Porter School and the university, and could hopefully become a hub of environmental technologies research in Israel in the future.

In describing the Porter School Building, Architect Nir Chen says, "The building is designed for the future. We're creating a kind of container for ideas, providing a receptacle within which future innovations can find a place as they change and develop. The building has the built-in flexibility that will keep it 'forever young' – hosting new scientific experiments, trying out new methods, and educating new generations for many years to come." To a large extent, this is the vision that will continue to accompany the Porter School as it prepares to implement the second phase of its building plan.

THE BUILDING IN THE CONTEXT OF ITS ENVIRONMENT

The Porter School Building is situated on the eastern borderline of the campus, just south of the Zoological Garden and next to the main entrance from the Ayalon freeway. It is located at the heart of Tel Aviv University's "ecology campus" – a cluster of facilities dedicated to research and education on biodiversity and conservation which includes botanic gardens, a research zoo, a genetic crops bank, and a facility that will house the Steinhardt National Collections of Natural History.

A Science Promenade, running 800 meters from the university train station along George S. Wise Street, leads up to the ecology campus. The promenade, a joint project of Tel Aviv University and the Tel Aviv-Jaffa Municipality, comprises a pedestrian pathway, bicycle lane, lighting fixtures, benches and four viewing platforms providing stunning vistas over the city and beyond. Environmental sculpture and ecological art will be incorporated along the promenade in the future, linking the external part of the Porter School Building to the exhibitions featured in its atrium. Future plans call for

Nocturnal view from the Porter School Building: the "Science Promenade" and the lights of Tel Aviv

this scenic and educational promenade to be connected to an extended promenade, which will eventually link to the Tel Aviv beachfront promenade network. In this way, the surroundings of the "Capsule Building" will serve as a demonstration garden of ecological design and form part of the dialogue between the School, the university and the surrounding environment.

The physical presence of the Porter School Building with its protruding capsule is sure to strengthen the visibility, the identity and the affiliations of the School.

Its unique shape, suitably located at the highest spot on campus, towers over Israel's largest urban expanse as a beacon for the environmental cause – and for Tel Aviv University's commitment to the environment. At the same time, the building strengthens the symbiosis between the Porter School and the Tel Aviv Municipality, which launched, with other stakeholders, a global city initiative aimed at elevating the city's standing. The innovation inherent in the Porter School Building is sure to facilitate the positioning of Tel Aviv as a truly global city.

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HOPES FOR THE PORTER SCHOOL BUILDING

The "Capsule Building" was first presented to the Board of Governors of Tel Aviv University on May 19, 2009 at a special conference, with the participation of the mayor of Tel Aviv and key officials from Israel's parliament and construction industry. Its completion has afforded the Porter School a home of its own, and plans call for the new building to house existing and future clinics and institutes that are associated with the School.

Ms. Elia Yair, who has been working with the School's master's students since 2005, is certain that providing the School with a physical home will increase its visibility and academic status within the university while promoting the students' sense of belonging. For years the students have been dispersed in different faculties throughout the campus; they now have a much-needed space of their own, she says.

"The move to our new building must serve as a catalyst for further action on our part. It challenges us to transform the School and its new building into the beating heart of environmental academic, research and public activity in Israel," says Prof. Dan Rabinowitz.

"The Porter School Building will lead to places we don't yet know," says Dr. Nesher. "It will increase the understanding of the interdisciplinary base of the School model which will hopefully catalyze changes in the academic structure of the university and enable the School to become an independent academic unit with full faculty members in the future."

"The building will be much more than the sum of its parts," says Dame Shirley. "It will be a major hub of environmental knowledge and research for the State of Israel, and for the whole Middle East and Mediterranean region. It will provide an opportunity for raising public awareness and placing Israel where it should be – at the forefront of international research in this critical field." Her impressions during a visit to the building site in the first months of 2013 sum up her hopes: "I visited the university the other day, as I often do. I donned a hard hat, climbed on a crane and was lifted high into the air for an overview of the incredible eco-landmark-in-progress. I have been involved in a great many causes, charities and undertakings over the past sixty years and take pride in them all, but the Porter School of Environmental Studies – the Foundation's greatest philanthropic commitment – takes my breath away. And it makes me happy that a place of such beauty can do so much good in our world."

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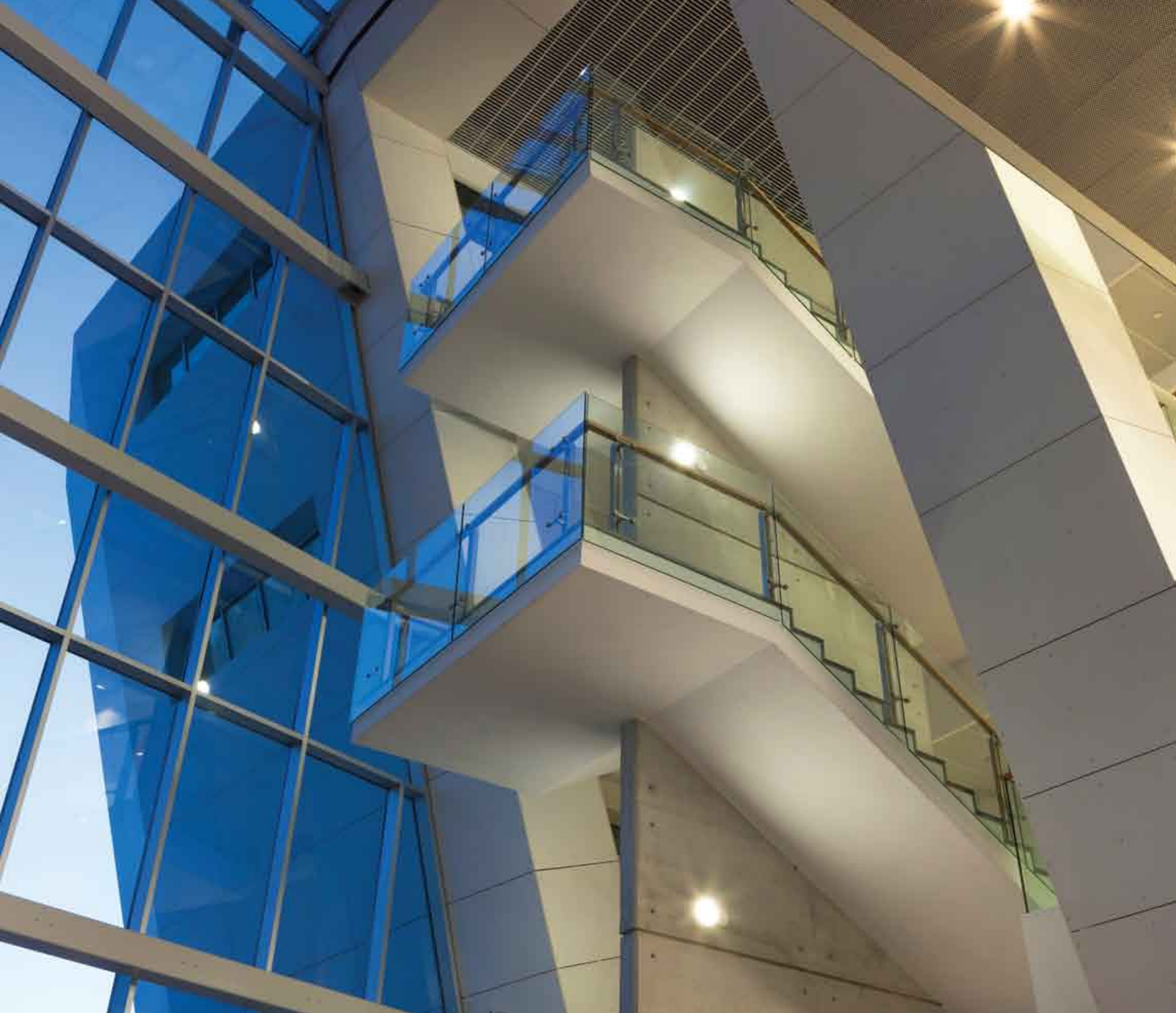

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10 an eye to the future

major

force

Founded in December 2000 as a school without students, without faculty members and without a building, the Porter School has established itself as a major force in the environment in Israel, touching every sector of society – government, industry and civil.

Thousands of students at Tel Aviv University have been exposed to environmental studies. Hundreds of students have taken part in the School's graduate programs. Some seventy faculty members at Tel Aviv University and thirty external researchers have partnered with the School in instruction, research and thesis supervision. A green building has been constructed to house the School's multifaceted activities. And the 2013/14 academic year has heralded yet another important change: joint and full appointments, giving the Porter School its first ever faculty members.

THE CHALLENGES

The new spirit, the new ideas and the new fields of instruction and research, local and international, went a long way toward raising environmental awareness and spurring environmental action in Israel.

Fifteen years ago, in his study on models of environmental schools worldwide on behalf of the Porter Foundation, Dr. Yaakov Garb wrote: "A change in the way a university has traditionally done its work can pose a challenge to faculty and staff with habits and a vested interest in the academic structures that have long sustained their creative and professional achievement."

How to explain, then, the achievements of the Porter School despite the difficulties? Growing environmental awareness in the first decade of the 21st century was, of course, a key factor in attracting students. In addition, a hard core of senior full professors at several Tel Aviv University faculties believed in the interdisciplinary vision of the School and was dedicated to its success. Furthermore, Tel Aviv University's presidents showed leadership, from the initial allocation of the land to the most recent crucial development by **Prof. Joseph Klafter** — the decision to appoint faculty members to the School in joint or full positions. And, of course, the unwavering, long-term commitment and support of Dame Shirley and the Porter Foundation enabled the School to flourish despite the financial crisis and the university's disciplinary structure.

The Porter School was introduced into Tel Aviv University at a time when universities throughout the country were struggling for their economic survival, says Dr. Nesher. Due to its independent funding, the School brought new fields of study when academic expertise in key environmental areas was scarce or non-existent. The new spirit, the new ideas and the new fields of instruction and research, local and international, went a long way toward raising environmental awareness and spurring environmental action in Israel.

FACULTY MEMBERS: THE KEY TO ENVIRONMENTAL INNOVATION

With the passing of the years and the branding of the Porter School, the Porter Foundation began to think about its sustainability in the short and long term. In 2011, a non-thesis master's program and an international program were initiated, bringing new income to the School. In terms of both student enrollment and financing, the School is comparable to any of the nine faculties at Tel Aviv University. However, it differs in one critical respect: until 2013, it had no faculty members of its own. This missing element has been at the center of deliberations at the Porter School and the Porter Foundation since 2008.

While the model of a school without faculty members may have been right for the School in its initial years, allowing it to achieve its interdisciplinary vision in cooperation with all nine faculties at Tel Aviv University without a predetermined emphasis on specific fields, this is no longer the case today. The lack of tenured academic positions means the School has been unable to take on researchers to promote expertise in innovative emerging environmental fields, and its students have encountered difficulties in finding thesis supervisors with interdisciplinary thinking in new fields.

Prof. Pinhas Alpert, a former head of the Porter School, admits to being visibly excited by the new ideas brought by Porter School students – whether green banking or personal carbon trading. The challenge, he says, is to find supervisors who will advise the students on their revolutionary projects, from energy policy, recycling technology, and water infrastructure and management to green architecture, industrial ecology, or life-cycle analysis.

To help solve the problem, the Porter School launched the post-doctoral Porter Fellows Program in 2006, funding more than a dozen promising scientists in their post-doctoral research in innovative environmental fields in order to help them gain tenure-track positions at Tel Aviv University faculties. However, while Porter Fellows take part in teaching, supervising and other activities in conjunction with the Porter School, their main affiliation remains to their respective faculties.

Dr. Dorit Kerret, one of the first Porter Fellows to obtain a tenure-track position in the Department of Public Policy, is well aware of the difficulties. While she "feels" like a faculty member of the Porter School, she recognizes that her academic advancement is dependent on the Faculty of Social Sciences. Dr. Kerret firmly believes that the environment is a discipline in the making. "But the legitimacy of this new discipline," she says, "which requires knowledge of a wide variety of fields, both in the soft and hard sciences, is not yet accepted in the university."

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THE CROSSROADS

In October 2008, a critical meeting took place at Oxford University, at the initiative of John Porter. The trustees of the Porter Foundation, including Sir Walter Bodmer, Professor of Genetics at Oxford, and the Porter School administration, including Dr. Nesher and Prof. Alpert, came together to discuss the School's growing need for faculty members of its own. During the visit, the participants looked at the model of Oxford's Environmental Change Institute (ECI), founded twenty years ago with the mission "to organize and promote interdisciplinary research on the nature, causes and impact of environmental change and to contribute to the development of management strategies for coping with future environmental change." They also met with Prof. Andrew Goudie, the geography professor who founded the ECI, and he, in turn, provided critical feedback and advice on the path forward. By the end of the visit, all were convinced that the Porter School needed its own researchers in addition to its partnerships with other faculties. However, the question of "how" to maintain its core value, interdisciplinarity, within the conservative, disciplinary structure of the university remained.

The proposed solution was joint appointments, with funding from the Porter Foundation to be matched by the university. Negotiations with the different faculties at Tel Aviv University began, and initial agreements with deans were reached. The model was supported by Prof. Zvi Galil, then president of Tel Aviv University as well as by then rector, Prof. Dany Leviatan and the director general, Mordehai (Moti) Kohn. On May 1, 2009, the university's Senate authorized joint appointments for the School together with university faculties, allowing the Porter School to have its own affiliated faculty members for the first time.

"The ultimate vision was to have nine faculty members," says Prof. Alpert. "This would have been fantastic since we would finally have faculty members with formal commitments to the School, whereas at present everything is based on volunteerism and on the commitment of existing faculty members at Tel Aviv University who are convinced of the importance of the School – whether Prof. Avital Gasith, Prof. Avi Kribus, Prof. Amos Ullman, Prof. Yehuda Kahana or Prof. Nir Ahituv, among many others." However, realistically, it was decided that at the first stage the program would begin with two joint appointments. A contract was signed between the university and the Porter Foundation in May 2011, which stipulated a donation for two joint appointments, to be matched by the university. It was a major breakthrough.

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MOVING FORWARD

New ideas were proposed by Tel Aviv University's incoming administration, President Prof. Joseph Klafter, Rector Prof. Aron Shai, and Vice Rector Prof. Dina Prialnik. As a result, negotiations took place between Tel Aviv University and the Porter School throughout 2012, 2013 and 2014 on an administrative solution that would allow the School to gain faculty members without losing its independence. The first stage was an interim proposal: the selection of new faculty members, funded by the Porter Foundation for their first three years, who would then be offered either joint or full academic positions, in addition to the two joint appointments agreed to previously. This idea is modeled on the prestigious Alon Fellowships which are awarded annually by the government to the most outstanding young researchers in Israel, providing three years of support conditional upon the university's continuation of their positions as full-fledged faculty members. The current head of the School, Prof. Dan Rabinowitz, has termed these the Manof-Porter scholarships.

In March 2013, a decision was made to go ahead with two joint appointments: one in the field of environmental ethics at the Porter School and the Department of Geography at the Faculty of Humanities, staffed by **Dr. Daniel Mishori**, a veteran teacher of Eco-Philosophy at the Porter School and of Corporate Ethics at the Recanati School of Management, and a second in either environmental medicine at the Porter School and the Faculty of Medicine or in environmental engineering, water resources and energy at the Porter School and the Faculty of Engineering. In response to a call for candidates for the second position, **Dr. Alex Golberg**, a young scientist with impressive interdisciplinary experience, whose research encompasses bioengineering as well as biomedical and environmental engineering, was ultimately chosen in 2014 as a full staff member at the Porter School. With these first appointments in place and the Manof-Porter scholarships underway, the School is well on its way to attaining a vital element for continuing success: its own faculty.

INTERDISCIPLINARY MODELS WORLDWIDE

In developing its model for future development, the Porter School looked at the experience of leading academic institutions worldwide that have succeeded in creating an academic hub for interdisciplinary study of the environment.

Declaring the importance of an interdisciplinary approach may be easy, but acting on these declarations is much more difficult – not only at Tel Aviv University but at institutions of higher learning around the world.

Proponents of the interdisciplinary approach maintain that complex issues require a holistic outlook. Real life problems, they contend, require an understanding of both the hard and soft sciences and can best be addressed by taking account of different perspectives. How can the problem of climate change, for example, be addressed from a geophysical aspect alone, without a careful review of its biological, economic, cultural, legal and political aspects?

Therefore, in developing its model for future development, the Porter School looked at the experience of leading academic institutions worldwide that have succeeded in creating an academic hub for interdisciplinary study of the environment. Two foremost examples are the Earth Institute at Columbia University and the School of Forestry & Environmental Studies at Yale University, both of which exist as independent units within the university.

The Earth Institute at Columbia was founded in 1996 "in the recognition that sustainable solutions require an interdisciplinary approach – one that prioritizes cutting-edge research, the training of future leaders and active problem solving for real-world issues." In 2002, a new phase in the development of the Institute began when Columbia University President Lee C. Bollinger called for Columbia to become a truly global university. Drawing on the expertise and resources available at the university and "hiring" faculty members from the different faculties, the Earth Institute has succeeded in running over two dozen degree programs on environment and sustainable development. Under the direction of Prof. Jeffrey D. Sachs and Steven Cohen, it comprises more than 30 research centers and some 850 scientists, post-doctoral fellows, staff and students and focuses on five core disciplines and nine cross-cutting issues. The description of the Earth Institute on the Columbia University website as an institute that "moves beyond the usual academic boundaries to create a multidisciplinary approach to questions of Earth's sustainability" expresses the vision of the Porter School as well.

The School of Forestry & Environmental Studies at Yale University, housed in a LEED Platinum building, has evolved from a professional school of forestry, founded in 1901, to one of the leading environmental schools worldwide. The process was largely due to the commitment of several key professors who recognized the academic need for interdisciplinary research and succeeded in creating a school that is academically and financially independent. The aim of the School, according to its dean, Sir Peter Crane, is "to prepare our students to meet profound global environmental challenges and seize the opportunity to find sustainable solutions that will benefit people everywhere." The School owes its success to its interdisciplinary orientation, and its "faculty are leading researchers and policy-makers dedicated to teaching from a cross-disciplinary perspective." The School encompasses numerous centers and institutes in the fields of business and environment, environmental law and policy, green chemistry and green engineering, industrial ecology, urban ecology, and more. "The School of Forestry at Yale is ultimately the model we want to follow," says Dr. Nesher as he envisions the possibility of some forty faculty members, in full or half positions at the Porter School within the span of a decade.

In order to learn first-hand about leading models for environmental studies, Dame Shirley and the director of the Porter Foundation, Edny Raz, visited the Earth Institute and the School of Forestry & Environmental Studies in April 2012. Writing to Tel Aviv University President Prof. Klafter upon her return, Dame Shirley recounted her impressions and urged the leadership of the university to visit these cutting-edge centers as well. She noted: "Although

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the models of these two leading institutions differed in some respects, they were in total agreement when it came to the interdisciplinary scope of their schools. This meant a balance of hard and soft sciences, with biological and life sciences being only one component. The heads of the schools at both Columbia and Yale insisted that social and human issues played a major role in environmental studies, and that it is imperative to encompass management, the social sciences, law, engineering, economics, urban studies and other fields, and not to privilege the life sciences." She concluded: "The main lessons to be learned from these stellar leading institutions is that they are independent, they are not subordinated to any specific discipline, they do not emphasize the life sciences, and they are truly multidisciplinary. This has been my vision from the outset, and this study trip has confirmed that this is the best approach to take for the Porter School in the future. I believe that we now need to work together so that the Porter School can join the ranks of these leading institutions worldwide."

The feasibility of the vision was reinforced by a research project undertaken by **Prof. Dan Rabinowitz** in the latter part of 2012. With the help of students who took part in his highly successful "Society and Environment" research seminar the previous year, he initiated a research project on the balance between the hard and soft sciences at environmental centers in leading universities, including Yale, Harvard, Berkeley and Columbia. Two models emerged: the first based on the expansion of an existing faculty or department to include additional environmental disciplines; the second based on the establishment of a new and independent center, institute or school dedicated to an interdisciplinary environmental orientation from the very start. Both models, says Prof. Rabinowitz, are based on the integration of soft and hard sciences, with the balance at the new centers similar to the balance at the Porter School – 60% soft sciences and 40% hard sciences.

As the new head of the Porter School, Prof. Rabinowitz is convinced that the Porter School model is the optimal model. "The founders of the Porter School," he says, "chose to establish a new and independent entity. The School does not belong to a specific faculty but cooperates with all relevant bodies at the university, as do such world-acclaimed academic centers as the Center for the Environment at Harvard University, the Earth Institute at Columbia University and the Environmental Change Institute at Oxford University, to name but a few. The treatment of environmental problems requires technological solutions and scientific measures, on the one hand, and an understanding of their social, economic and political context, on the other. As an independent entity bringing together researchers from different disciplines, the Porter School is well poised to do just this. As head of the School, I am fully committed to continuing and even strengthening this interdisciplinary orientation."

STRETCHING THE DISCIPLINARY BORDERS – NATIONALLY AND INTERNATIONALLY

To further its interdisciplinary vision, the Porter School is continuing to explore means of stretching the interdisciplinary borders both within and outside the university. One new initiative is the launch of new undergraduate level programs with partner departments at the university. The new programs would be first of their kind in Israel and among the few schemes globally to offer unique academic combinations, such as Mechanical Engineering and Geophysics with an Environmental Studies emphasis.

In parallel, the School is continuing to extend its collaborations beyond the university, and its new building opens up additional opportunities for new partnerships. One such venture is the establishment of a new Institute for Innovation in Transportation, together with the Alternative Fuels Initiative at the Prime Minister's Office. The Institute will enable researchers from Tel Aviv University and other research universities in Israel and abroad to get funding for pure research on innovation in transportation, which will benefit the environment. Young entrepreneurs with promising ideas in this field will also be provided with a temporary space in the building's EcoWall, complemented by modest funding, to enable them to further develop their inventions before venturing out to the world at large.

In addition, international relations are continuing to play an important part in the Porter School vision. To a large extent, the future of the School will depend on the relations it will forge with leading bodies worldwide – whether within the framework of the second stage of the Porter School Building which is envisioned as an environmental technologies center of excellence in partnership with industry, government and academia in Israel and abroad, or within the framework of cooperative ties with leading academic and research institutions worldwide.

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Dr. Nesher addressing participants of the first graduation ceremony at the Porter School Building

The buds of such cooperation are already visible. Columbia University's Earth Institute and the Porter School, in cooperation with the Columbia Global Center/Middle East in Amman, organized a collaborative, regional expedition program aimed at acquainting students with the Israeli-Jordanian-Palestinian situation from an environmental-political perspective in the summer of 2013. Entitled "Regional Sustainability in the Middle East," the two-week program afforded students the opportunity to learn how environmental issues span geographical boundaries, while experiencing first-hand the social and political challenges facing the policy-makers and environmental scientists who seek to address them. "The cooperation between Tel Aviv University and Columbia University's Earth Institute enabled this unique cross-border experience and introduced students to the environmental consequences of the political situation in the region," says Dr. Nesher. It is hoped that this pilot project will lay the foundation for more extensive cooperation between Columbia University's Earth Institute and the Porter School on student-faculty exchange on joint research projects.

On the research front, the Porter School and Tel Aviv University are central partners in a new international, interdisciplinary initiative of the Helmholtz Association, Germany's largest research organization, to address the challenges of environmental risks, water availability and climate change in the Dead Sea region. Under the title of DESERVE – Dead Sea Research Venue, the five-year, €3 million project, which was initiated in 2013, uses the unique area of the Dead Sea as a "natural laboratory" to study climate and environmental changes, with a focus on natural risks, the development of an observatory network and a regional earth system model. One part of the project will focus on the promotion and education of young scientists, including doctoral students at the Porter School, and on the convening of interdisciplinary summer schools and short and extended stays of young scientists at the Helmholtz Centers and other universities. Prof. Alpert, former head of the Porter School, coordinates the climate and weather research group of the project.

TOWARD THE FUTURE

Today, the Porter School can look back on its accomplishments with pride, but it must ask some hard questions as well. Will it achieve full academic independence? Where should it invest its resources in the future? What should be its priorities?

When founding professional director, **Dr. Arie Nesher**, envisions the future of the School, he sees a firmly established and independent academic unit, whose strength will contribute to the strength of the university. He is convinced that the Porter School Building with its distinctive capsule will enhance the position of the Porter School within the university, the country and the world, with ties to leading environmental institutions globally, East and West. He envisions new partnerships based on the triangular connection between government, industry and academia. This framework will open up exciting opportunities for innovative environmental research and for cooperation between the academic and the start-up world. In the interim, the Porter School continues to develop and to promote its interdisciplinary approach through joint programs, joint clinics and joint institutes with all of the faculties at Tel Aviv University. It continues to promote its links with government, industry and civil society. Joint and full appointments are forming the nucleus of the School's future faculty members and bringing innovative environmental areas into the university. Porter School graduates are continuing to serve as agents-of-change in every sector of society – government, industry, NGOs, and even the army.

"Fourteen years ago the Porter School of Environmental Studies became a 'virtual school,' and in 2014 we moved into the magnificent 'Capsule Building' the School will call home," says Dame Shirley. "One of only a few schools of its kind in the world, it is my hope – and my vision – that it will provide real and practical applications of sustainable technology that establish Israel as a leader of environmental education. A world-ranked school of environmental studies that improves the lives of the people – and the land – of Israel, contributes to global welfare, and becomes an international hub for the environment is our aim."

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Israel as a leader of environmental education

The Porter School of
Environmental Studies
ביה"ס ללימודי הסביבה ע"ש פורטר

Tel Aviv University
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