



Walk tall: A 100-metre aerial walkway allows visitors to Kew Gardens to stroll among the tree tops and learn something about this unique and little understood habitat which is the focus of new conservation efforts. (Photograph: Kew Gardens.)

The accolade follows a period of financial difficulties and other uncertainties. For several years budget increases for Kew had failed to keep up with inflation, leading to the loss and reduction in many activities. In 2002, the House of Lords science and technology committee published a report, *What on Earth? The Threat to the Science Underpinning Conservation*, which called funding to be restored to the level ten years before and a

change in status so that staff could apply for funds from the research councils as their university colleagues can. Last year Kew won a 20 per cent increase in funding but, according to Crane, that does not bring levels back to where they were 10 years ago. He said the UK's work was further complicated by three separate government departments funding research.

As well as the research, Kew is a major international visitor

attraction located in more than 130 hectares of landscaped gardens. Last year more than one million people visited the gardens, including more than 120,000 children. Kew attaches importance to education about the environment and sustainability, which is also part of its biggest ever summer festival, *Go Wild*, currently running at the gardens. Part of the festival includes a 100-metre walkway that winds its way through the treetops, allowing visitors a glimpse of one of the least known habitats in the world. The walkway has also been used as a focus for a conference last month aiming to establish a Global Canopy Programme – 20 tree-top laboratories around the world to study this habitat and its occupants. The programme's director, Andrew Mitchell, says that forest canopies are the interface between 90 per cent of the earth's biomass and the atmosphere across a quarter of the globe.

"If we are to significantly reduce biodiversity loss by 2010, in line with commitments made at the World Summit on Sustainable Development, then we will need innovative investigations like the Global Canopy Programme," says Klaus Topfer, director of the United Nations Development Programme.

Obituary: Ira Herskowitz

Jasper Rine pays tribute to a distinguished career spanning several fields and a personality that was a legend among the many great teachers at UCSF.

Ira Herskowitz, a leading figure in genetics, died of pancreatic cancer, on April 28, 2003 at the age of 56. For those people in so many fields who knew him, his death has left an unfillable void, for there is no one like him.

Ira and his identical twin brother, Joel, were first introduced to genetics in their father's *Drosophila* lab at Indiana University, and then at Saint Louis University. Ira went on to college at Caltech, with no initial interest in genetics, and Joel

went on to Princeton majoring in music and then on to a career in medicine.

At Caltech, Ira worked in Bob Edgar's lab, alongside Jonathan King, and became deeply impressed by the ability of studies of bacteriophage to reveal how genetic programs are regulated. Having made that decision, he then went to Ethan Signer's lab at MIT for his graduate work, where he worked out how expression of bacteriophage lambda's late

genes is restricted to late in the life cycle of the virus. He established one of the earliest examples of positive control of gene expression by showing that the Q protein functions to turn on the late genes needed to make the heads and tails of lambda.

During that time, he also worked with Costa Georgopoulos to discover host mutants with very specific defects in virus growth. He was offered a faculty position at the University of Oregon while still a graduate student, but decided to spend an additional year at MIT before taking that position. During this year he worked with David Botstein, discovering the modular design of bacteriophage genomes by making hybrid phage well before

the application of molecular cloning techniques. During this time, Ira and David took the Cold Spring Harbor Yeast Course together, which was the birth of Ira's interest in yeast, which lasted his entire career.

In Eugene, Ira's lab studied regulatory biology in lambda and in yeast. Among Ira's greatest strengths was his ability to recognize biological problems whose resolution would lead to a fundamental advance in understanding a field. Ira was attracted to the paradoxical nature of Hawthorne's deletion, which changed an alpha cell to an a cell. Since the alleles of the mating type locus are co-dominant, it would be impossible to convert one to the other by deletion. Trying to make sense of this puzzle led Ira's lab to lay out much of the foundation of the field now known as yeast mating type and filled in much of what we know about its many dimensions.

It is fair to say that the formulation and proof of the cassette hypothesis for how cells switch mating types was the last major genetic problem to be solved purely by genetic means and without use of molecular cloning methods. Ira's lab was quick to exploit these methods when they became available, and indeed the cloning of the alpha factor gene in his lab led to a patent for heterologous protein secretion that was a mainstay of biotechnology for many years. After nine years in Eugene, he moved to UCSF in 1981 where he turned his attention to studies of cell biology, using the approaches of a geneticist to advance progress on topics as varied as polarized growth, signal transduction, cell-cycle regulation, RNA transport, sporulation, cisplatin resistance and the pathogen *Ustilago*. His most recent work, still on going at UCSF, was as co-organizer of a large effort aimed at understanding how human genetic variation leads to different responses to drugs. In short, he saw unlimited opportunities for using genetics to illuminate different areas of biology and was increasingly drawn to problems of direct clinical relevance.

Ira was known as a legend among the many great teachers at UCSF, where he was awarded the Distinguished Teaching Award. Moreover, all of Ira's students and post-doctoral fellows benefited from learning how to teach from Ira, and many of these have gone on to receive teaching awards at their respective institutions based upon the skills they learned from him.

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We can all think of famous scientists who have produced any student who went on to a highly successful independent career. With Ira, the opposite is true. An amazing fraction of the 70+ students and post-docs who trained with Ira have gone on to make major contributions in science independently. Moreover, from the earliest days of his career, Ira took special interest in promoting the careers of women in science, long before this issue had the political traction that it now enjoys. His early efforts have paid off handsomely, as shown by the many successful women scientists whose careers he launched, including two who are presently chair and vice-chair of departments at top-notch research universities. Appropriately, a graduate program at UCSF was recently named the Ira Herskowitz Graduate Program in Genetics.

Ira's research was widely recognized by various honors including a MacArthur Award, the Eli Lilly Award, election to the National Academy of Sciences at the age of 39, the Gregor Mendel Medal from the Genetical Society of Great Britain, and most recently, the Thomas Hunt Morgan Medal from the Genetics Society of America in 2002, and the Rosenstiel Award from Brandeis University the week before he died. Characteristically, one would

have to look deeply into his CV or into the dark corners of closets in his home to learn of Ira's accolades as the medals and diplomas of these awards were never evident in his office.

One side of Ira well known to his closest colleagues was his intense interest in sports. In Eugene, this was manifested by his interest in the Ducks in basketball and track (few could be interested in Duck football). Ira's favorite athletes included Tiger Woods and, especially, Larry Bird. The ability to perform under pressure always impressed Ira, particularly the way in which Bird relished the chance to make the game-deciding shot.

I was always impressed by the parallels between these giants in their fields and Ira's ability to take on more and more responsibilities including serving on the Albert Lasker Award jury, the NIH Council, and the Howard Hughes Medical Institute scientific review board, all at the same time while leading a large active research lab and carrying a full teaching load. If he had a weakness, it must have been kryptonite.

Ira was first diagnosed with pancreatic cancer in November of 2001, and based upon the early detection and his rapid recovery from surgery, and both radiation and chemotherapy, there were many reasons to believe that he would be in the lucky few percent of survivors of this disease.

However, in January of 2003, two days before he was scheduled to attend an NIH council and then perform at a concert in Bethesda, he learned that his cancer was back and had metastasized to his liver. Ira understood fully what that diagnosis meant, yet completed the preparatory work and went to the NIH Council meeting and then performed at the concert. No one at either event understood at the time the circumstances under which he was performing. It is hard to imagine how anyone could do that, but it is even harder to imagine Ira doing anything less. He was the Larry Bird of our field.

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