

University at Albany - State University of New York

Researcher

Volume 1, Number 1

Spring — Summer 1986

Atmospheric Sciences

**Maya Grave
Uncovered**

**Profile:
Hans Toch**

Opinions:

Raymond T. Schuler
Walter Gibson
Vincent O'Leary

Uncoiling DNA



Contents

Features

Atmospheric Sciences Research Center 2
A look back over the past 25 years.

Uncoiling the Mysteries of DNA 7
It may hold a key to cancers and advance computer technologies.

Profile: Hans Toch 10
One of the world's leading authorities on criminal justice describes his career as "pure serendipity."

PCB's in Breast Milk 14
Public health scientist Brian Bush believes the dangers of PCBs need to be kept in perspective.

Treasures of the Past 17
Dig we must, say scholars in Belize, Cyprus and Yugoslavia, who are finding new clues to our many pasts.

Departments

Immunogenetics: The gene machine 5

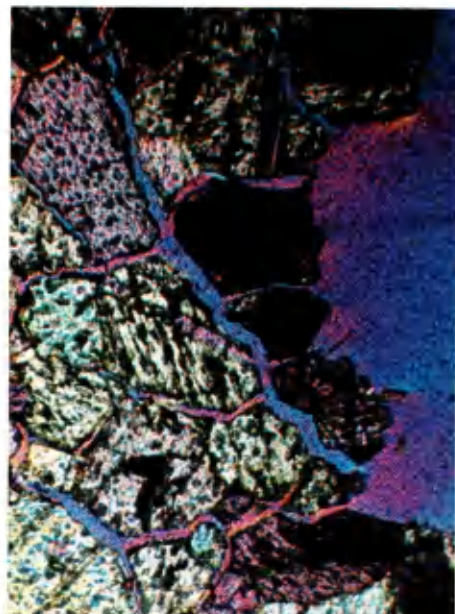
Public Policy: Does money walk? 20

Opinions

Vincent O'Leary 1

Raymond T. Schuler 6

Walter Gibson 21



Cover: Photomicrograph by Roger J. Cheng of the Atmospheric Sciences Research Center shows flyash caught in a cloud droplet. The flyash particles in water exposed to sulfur dioxide cause the needle-like sulfate crystals to grow. Cheng's work provides graphic demonstration of acid rain production.

Top: Looking like a satellite photograph of the Chesapeake Bay, this Roger Cheng photo shows a cross section of marble from the Schenectady (N.Y.) City Hall. Photographed through a polarizing microscope, the exposed marble shows the effects of acid rain. The wide-open intergranular space was penetrated by sulfuric acid.

Bottom: A black-figured pelike, or vase, from an excavation site in Polis, a town of northwest Cyprus. Professor Paul Wallace, who heads the dig, dates the pelike at about 550 B.C. It depicts Theseus slaying the Minotaur, the evil monster to whom the Athenians paid an annual tribute of seven youths and seven maidens.

Researcher is published each semester by the University at Albany, State University of New York.

Editor
Patrick J. Hunt

Associate Editors
Mary Feiss, Claudia Ricci, Vince Swecney, Christine McKnight

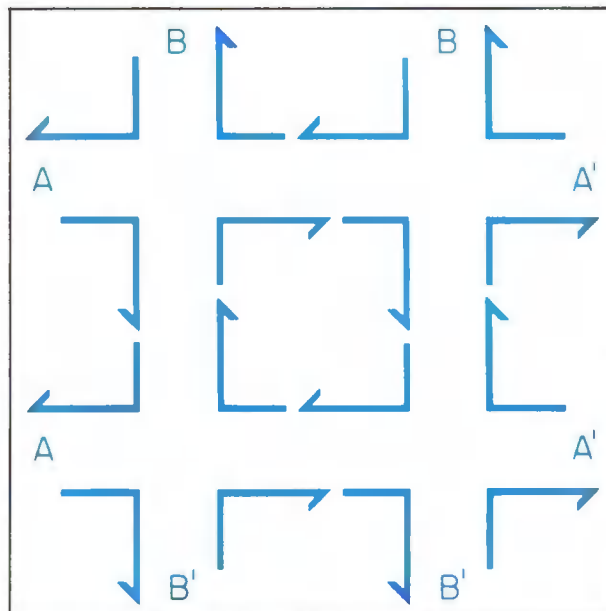
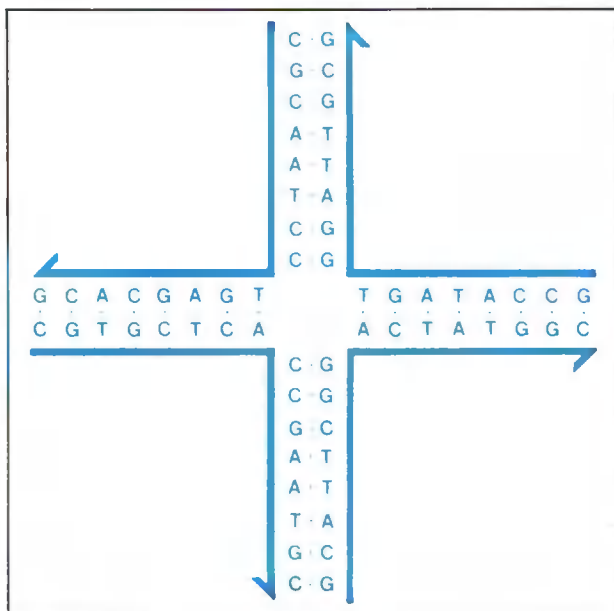
Assistant Editors
Deborah E. Brighton, Brenda Oettinger

Art Director
Anne Ferretti

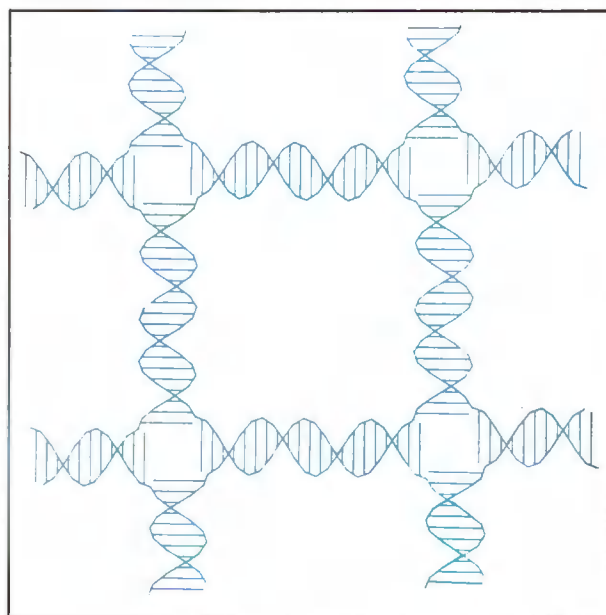
Business and Production
Debby Vitello, Judy Axenson, Susan Freeman

Composition
Educational Communications Center

Editorial Office
Researcher, Adm. Rm 238, University at Albany,
State University of New York, Albany, New York 12222



Clockwise, from top: the detailed sequence of a DNA junction made by Seeman and his colleagues; the way in which several junctions could associate; a network which could be formed by technically joining junctions associated this way.



build schools, bridges, lots of things. It all depends on demand. Imagine, for example, putting together little devices to release molecules that would control cellular processes. If we can really control structure on that scale, then there are an enormous number of biomedical and perhaps industrial processes that might be developed. The practical applications would come quite quickly."

Unforeseen benefits like this, says Seeman, are the nature of scientific inquiry.

"This is the kind of thing that points up the importance of basic research," says Seeman. "Here I am, studying recombination, a process so far removed from computer science that no one would think to ask about its application in that field. And yet, it turns out that this process may be a crucial step in the development of

smaller computer bits. You don't know where discoveries are going to come from, or what areas they'll impinge on."

Seeman believes a related project of his, funded by the NIH's National Institute of Environmental Health Sciences, could be valuable in assessing the impact of potentially dangerous environmental chemicals. Similarly, some of his work has already forced scientists to re-evaluate their "intuitive notions" of order and regularity in the solid state.

Seeman, 40, came to the University in 1977 after earning his Ph.D. in crystallography/biochemistry from the University of Pittsburgh and doing post-doctoral work at Columbia and MIT. Besides annual grants from the NIH for the last four years, he is the recipient of a prestigious, Research Career Development Award, which includes most of his salary

and benefits for five years and frees him from certain teaching obligations to pursue research.

By his own admission, Seeman's work is "moderately arcane." Only a handful of fellow scientists even understand the nature of his research. But that's the way he likes it.

"You start off trying to do something because it sounds like a good idea," he says. "But you rarely wind up where you think you'll be. In fact, if you did, it would be kind of boring.

"It's a great ego trip. You're unlocking secrets from nature which nature doesn't want to give up readily. I have to work hard at getting interesting results, and it's not easy. It becomes all-consuming. It's the ultimate challenge and adventure." ■



PROFILE: Hans Toch

“P

ure serendipity.”

The words are spoken with a chuckle, yet he is serious in offering it as an explanation for a lifetime of scholarly endeavor that has brought him to international prominence measured by awards, several books written and nearly 100 published articles in professional journals.

Hans Toch, Distinguished Professor of Criminal Justice, speaks between puffs from a hearty-aroamed Mexican cigar and sips from a huge delft mug filled with black coffee. “The coffee drinking I acquired in my two years in the navy,” he smiled. “Unfortunately I came to cigars too late—you see, from ages 11 through 16 I lived in Cuba.”

In 1941, at the age of 11, he and his family were rushed out of Austria to Cuba. “You went wherever the Jewish Relief Organization could send you. We were originally intended to be sent to Shanghai, but the Japanese invaded just at that time. We were fortunate they were able to switch us to Cuba.”

As a young scholar in the U.S. he directed his attentions first towards the psychology of religion, and then towards research in public opinion and social movements. He chose Princeton for his doctoral work specifically to work in these last two areas with Hadley Cantril, the man whose memorial award he would receive 20 years later.

Toch's books on the subjects of the criminal, of violence, of prisons, crmm two levels of the metal bookcase behind his chair. While framing the case on either side, and offering the contrast of gentility,

by Vinny Reda

are two, long, slender, Chinese silk screens, their pictures playful, much like the tone in which he evaluates himself and his history.

“How did I get started?” he said. “After I got my PhD at Princeton in 1955, I was drafted into the Navy. When they gave me my release in the summer of '57, it was the wrong time of the year to get a decent job.”

At Michigan State University noted professor G.M. Gilbert, a psychologist at the Nuremberg Trials, was taking a sabbatical, leaving his “Legal and Criminal Psychology” undergraduate course behind.

“I was told if I taught that course for a year I could then get a respectable job in the university. So I was hired as a one-year instructor at \$5,500 and set out to endure it, scraping by mostly by reading the course text book one step ahead of the students.”

What he found was that the subject was dominated by “sexy books” on Leopold-Loeb, Saccho-Vanzetti and such other infamous headline grabbers. He didn't mind the lack of scholarship, he said, until he found out his psychologist colleague was not returning. The course, said MSU, was now his alone.

“As a result I set about to write my first book, *Legal and Criminal Psychology*. Frankly, it really didn't get me much more into the subject. It was basically for my own use. I collected a lot of newspaper clippings, went out with the parole board and I took a summer session at the University of Wisconsin as background. The book wasn't terribly interesting.”

Stage two: “My main concern at the time was in exploring visual research as it pertained to standard experimental psychology. We were studying procedures where the stimulus material could have some thematic specificity to it. Because of

my course, it was easier to choose slides which dealt with violence.

“When the study was done in 1962 I sent a copy of the findings to the Department of Corrections in California. It was the only corrections department in the country at that time which had a research operation of consequence. In 1963, they asked me to come out and discuss with them the possibility of administering the procedures to inmates, as another method of classification.

“Well, here was another instance of serendipity. While I was out there Governor Brown—the older one—set as a priority of the department of corrections research into violence, particularly involving repeat offenders.

“So I became project co-director at the Institute for the Study of Crime and Delinquency. I was based in Oakland and Berkeley.

“And another serendipity: the Oakland Police force at that time wished to study violence within its department. J. Douglas Grant, director of research for the Department of Corrections, and now a colleague, was having lunch with the Oakland Police chief one day, and proposed extending our research into his police force.”

Commuting summers and holidays, first from Michigan, then from 1965-68 as a visiting lecturer at Harvard, and finally in 1968 from Albany, he initiated in Oakland in 1969 a retraining unit for violence-prone police officers.

Meanwhile, the book on the study, *Violent Men: An Inquiry into the Psychology of Violence*, also emerged in 1969, a time when Washington and the public at large were becoming consumed with a seemingly irreversible trend of violent behavior in society.

“The book received probably more attention than it deserved,” said Toch. “I've had a tough time outliving it.”

W

hat Toch had also grown into now, however, was his subject matter. “I had become involved with research in the field of violence. It is very difficult after a time to divorce yourself from a discipline. It was with police and prisons that I had begun to feel most comfortable.

“A shift appeared later in my career when I turned my interest to the mental health care of people who were inmates. In

general I began studying people who were producing problems for themselves in life. It just so happened those people were prison inmates."

His work also became the basis of a federal Health, Education and Welfare grant through the Research Foundation of the University, entitled "Research on Violence Prevention by Police," which in turn led to his book *Agents of Change: A Study in Police Reform* (1975).

Now, as professor and charter faculty member of the School of Criminal Justice at Albany, he became principal investigator of another federally funded project: "Self-Destruction Among Prison Inmates."

This time the publication which followed the research effort would be *MEN IN CRISIS: Human Breakdowns in Prison*. Published in 1975, the book would win the Hadley Cantril Memorial Award for significant social contribution to the social and behavioral sciences. A Justice Department grant for research into "Interventions for Inmate Survival" would likewise lead to the 1977 publication, *Living In Prison: The Ecology of Survival*.

His aim, he said, was to explore the adjustment problems of inmates not as a criminologist, but as a psychologist. He applies the same methodology to his current research, which deals with prisoner careers.

"The fact is that by being able to trace the past of a prison inmate in some detail, we can get a better picture of a personal history than most psychologists are able to with subjects. It just so happens that some of the people we deal with have intriguing relationships between personal problems and the crimes they commit.

"For example, inmates who are emotionally disturbed and who embark on careers as criminals are likely to have their personal difficulties reduce their effectiveness as burglars and robbers. On the other hand, there are rapists who are emotionally disturbed rapists and rapists who are not, but the emotionally disturbed ones are often the most proficient and dangerous."

Through the years he has had no sympathy with their crimes, but always with the conditions prisoners endure. "I hope I do," he said. "I mean, some of the object of my game is to reconstruct their perceptions of their conditions. That requires absolutely a suspension of judgment and predilection towards empathy.

"If you look at these people in a cold and cynical way, you are not a psychologist."

Circumstance brought him to the criminal justice field, but he geared himself towards making the experience as human as possible. He has supplied several news features with general statements on the types of people who fit certain crimes. Yet he finds such general studies and conclusions "one of the most boring issues" in which scientific psychologists, as well as scientific sociologists, can engage.

"I imagine it is just because psychologists have a tendency to make the general claim that 'most offenders are emotionally disturbed,' that sociologists feel free to state 'no offenders are emotionally disturbed,'" he shrugged.

Toch said that once someone observes an offender and attempts to simply characterize him or her, he is separating himself from scientific psychology. "He is just concerned then with individuals.

"The psychologist Gordon Allport, who was the reason I went to Harvard for a year, devoted much of his work to dealing with this dilemma: how can the psychologist straddle general statements while respecting the individual?"

"My way of getting my cake and eating it too has been to deal with typologies, in-

terviews that get me a feel for the uniqueness of people while making general conclusions about them. To do this you have to obtain a respectable number of personal histories, but it's my way of maintaining an understanding and concern for individuals.

"It is not traditional research strictly. I am interested in asking questions with respect to the individual to find his unique problems and how he must cope with them. Otherwise, the research would be bloodless and ambiguous."

It would also not broach the political realm of seeking change in prison conditions, and in the ways society treats the criminal both inside and outside of jail. The concept of a school of criminal justice offered him that connection.

In his years at California, he had seen the growth and demise of the nation's first doctoral program in criminal justice, at the University of California—Berkeley. "That enterprise endured a stormy history," he remembers. "It took years, beginning in the early '60s, for it to gain academic respectability, first within the Berkeley community, and then outside among officials in state government. Then,

Violence and Mental Health

Recently the federal government has turned its attention to the paucity of information society has concerning violent offenders who are also emotionally disturbed. And so they have turned to Hans Toch and colleague Kenneth Adams to explore new territory.

"There isn't much I can say yet, frankly," said Toch, "because we are two years down the road from discovering anything. The point is that there are individuals who not only are violent offenders but who also have mental health problems.

"The question to be studied is the relationships between these two sets of facts. In some instances direct links will be found between individuals' problems and the offenses they commit. In other instances these factors will be separately and unrelatedly present in the same person."

The research project, "Violent Of-

fenders Who Have Had Mental Health Problems," is funded by a \$150,000 grant from the National Institute of Justice.

"Since both violent offenses and mental health are areas which Dr. Adams and I have been very involved with over the years, it was logical that the government might consider us for the project.

"Again, we will be interviewing offenders who are coming into the prisons, tracking their records back to when they were in their communities and trying to see what relationships exist, dividing them into groups comprising different mixtures of mental problems and various offenses.

"At this point, it is an exploration that can go in several directions. What remains constant is that the goal of the effort is to map the terrain but not to lose sight of the individual people who occupy that land."

when it did achieve respectability, it ran into a conservative political climate which sealed its doom.

"This program at Albany became the premiere doctoral program in the interdisciplinary field. It still is the leader, I believe, among the nine PhD programs now in the country.

"Frankly, it's an odd model these days for a university enterprise. Problem-centered PhD programs are very rare. Why, for instance, aren't there any PhD programs dealing with the problems of farmers? There used to be PhDs in urban planning and landscape architecture, worthwhile fields, but they were cut back at most universities in this country.

"Criminal Justice states that there is a problem out there, and that people in various disciplines ought to get together from the social sciences and deal with it. The concept is too 'applied' for most universities these days. A social science ought to have a theoretical base, says current thinking.

"The miracle is that we exist and continue to exist, just as atmospheric sciences has been able to exist and grow—and deservedly so—in this institution."

No matter how popular the program, however, or how much it has been reinforced by state and federal research grants, Toch does not put the school's reputation on a pedestal.

"Why do we exist? No one dramatic reason. I suppose the world could exist without us. I suppose one reason makes sense: since there are students in our university community interested in the subject, the institution should have teachers qualified to teach them. And then it's easier to do that when you establish a concentrated expertise.

"Also, once you get such a subject, it's good to have various disciplines approaching it. I was fortunate: within a sociological context I was allowed to deal with social psychology. I am not even a mainline criminologist. Only lately has psychology become fashionable within that field again.

"Back in 1968, they may have taken me on here because I was the closest thing they could get to a psychologist who was a criminologist.

"At any rate, the last excuse for a criminal justice PhD is more pragmatic. There are people in government who some years ago realized that not only did they not have the answers to applied questions about crime and criminal justice, they had no answers to basic questions.

"You can either set up an expensive research institute to deal with such problems, or make researchers live off soft

Tracking Behavior

The key to enhancing the rehabilitation process for current prisoners may be in studying the complete prison records of former inmates. So presumes one of two projects directed by Dr. Hans Toch of the School of Criminal Justice and Dr. Kenneth Adams, a recent graduate.

The "Study of the Careers of Inmates Over Time" is a research project that has completed a lengthy data-gathering stage, says Toch.

"The recording of nearly all prison behavior incidents is over now, and we are at the very first stages of analyzing the data. I'd say we're about a year away from releasing our study."

Toch has dealt extensively in his career with projects that document numerous individual cases in order to classify experiences into types — typologies. This particular project, funded by a \$150,000 grant from the National Institute of Mental Health, uses the method to "an even greater extent than usual," he said.

"The typologies are not only clinical, but heavily quantitative. We are tracking the events of the prisoners' lives over

time, with special attention given to all the problems that confront them. Mental health problems are naturally given attention, but also other common problems in prison, disciplinary and otherwise.

"Through time series you can trace the inmate's behavior, the prison's reaction to that behavior, and then his reaction to that. We will study the services available to the inmates and how they respond to those as well. It is an attempt to reconstruct personal histories while forming general concepts about prison life.

"As with nearly all the work I've done, the research project is meant to include possibilities of practical application. In this case, we are talking about people who are no longer in prison. While some of their lives after prison are being followed up, the main emphasis is on their prison records and that experience.

"We realize that practical application of course can no longer have anything to do with these people. But from them we may be able to find ways of ameliorating or enriching the lives of those still institutionalized."

money which is unreliable — or, you can incorporate your research into an academic enterprise.

"The last was a risk. We were not opening our doors here as a how-to program for agencies to train people in handcuffing. We were a doctoral program seeking to increase the sophistication of the subject.

"We could have opened the doors and had nobody show up. As it was 15 people showed up, and it's grown to about 180 now. It looks like it's become a discipline. There are journals — this university publishes one. There are grants; there is ongoing research."

And much of that research includes Hans Toch — research that will be applied someday, he hopes, in improving the lives and rehabilitation of those in prison.

"I guess when I was young I did my share of going on the lines and picketing. Now I suppose that whether it is just immodesty or the rationalizing of the aging process I think the best way I can effect things is by gathering information and ordering it so it is useful.

"Maybe then people will think about it. And maybe I will be invited to be involved in an advisory capacity to make this something of a better world.

"I do believe in certain things: for one, that you must diversify the kinds of programs and settings that are available in prisons; that too often those who can not emotionally and psychologically manage are being thrown into the prison yard with everyone else. There are more creative arrangements possible and essential."

Toch's current research may bring about further advances in understanding and dealing with the institutionalized: two projects funded at \$150,000 each involving inmates and violent offenders. In each he will be assisted by Kenneth Adams, who received his doctorate in criminal justice at Albany.

A consultant in statistical analysis was also required on one of the projects. The man whose work most applied was Louis L. McQuitty, now retired as chairman of the psychology department at Michigan State University. Twenty years ago, he gave Hans Toch his first job, forcing him into criminal justice.

"The choice of McQuitty was just a matter of him being the ideal person," said Toch, who then smiled. "Another example of the serendipity I was talking about." ■

PCBs in Breast Milk

Facts and Fears

by Claudia Ricci

Ever since midwife Katski Cook began delivering babies on the Akwesasne Mohawk Indian reservation on the St. Lawrence River, she has pushed new mothers to breast-feed their infants. But a few years ago, some Mohawk women began worrying that pollution on the reservation might be finding its way into breast milk and threatening their babies' health.

Cook was approached by one woman, living on a highly polluted peninsula within the reservation called Raquette Point, who became alarmed when scientists scoured her farm, taking hair samples from her animals, leaves from the trees, as well as samples of soil, water and air.