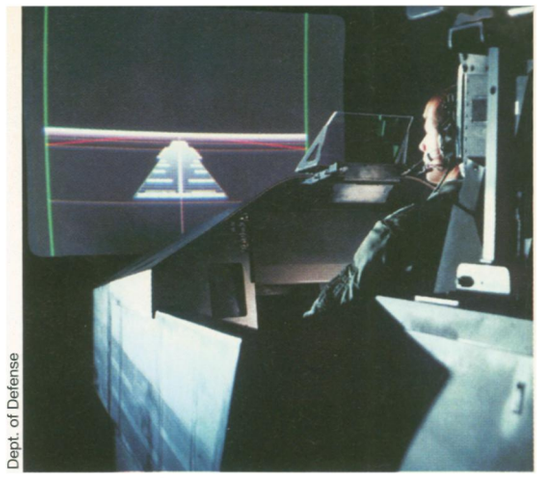
Assessing OTA's Legacy

Examining what remains, now that OTA is gone

By JANET RALOFF



Dept. of Defense

Last month, OTA reported on the value of separated military crews training with each other via interacting combat simulators.

Four weeks ago, Congress did the unthinkable. It abolished one of its four service agencies—a low-budget, prestigious research center renowned for its thorough analyses of technology and its impartial assessments of the public policy options that stemmed from that technology.

Today, in a small storefront building six blocks east of the U.S. Capitol, a skeleton crew packs up what's left of this Office of Technology Assessment (SN: 10/7/95, p.228). They're hoping to archive its documents—correspondence to and from federal legislators and some 750 reports prepared at Congress' request over nearly a quarter of a century.

To many, this is the sum of OTA's legacy.

But not to Michael G. Norton, director of the Parliamentary Office of Science and Technology in London. "There are five European equivalents of OTA. And I think it's fair to say all were motivated by the example of the U.S. OTA and have, to a greater or lesser extent, drawn on [that] model for their design and objectives."

Ironically, he notes, last month—during the very week OTA was closing up shop—the European Parliament voted to make its fledgling technology assessment agency in Luxembourg permanent.

Closer to home, some 20 to 25 veterans of OTA held a meeting last week under the auspices of several Washington, D.C.-area technology policy institutions. They're investigating the possibility of reconstituting some small, privately funded vestige of OTA—to be called the Institute for Technology Assessment (ITA).

Explains Vary Coates, who has been spearheading the venture, "we would like to preserve the core institutional memory and culture of OTA in hopes that it will be refunded at some later time—or that we can find alternative sources of funding to continue its work in the public interest."

None of these organizations that hope to carry on in the tradition of OTA appears close to duplicating what was lost. For instance, even if ITA finds the $500,000 to $1 million a year it seeks to spring into action, it will not have the financial independence that helped safeguard OTA from conflicts of interest.

Most European centers, with 6 to 10 full-time analysts, are a fraction of OTA's former size. And "although OTA served as a model for the European organizations, in practice—and sometimes in principle—this model has not been followed," observes Josee van Eijndhoven, director of the Rathenau Institute in the Hague, the Dutch OTA.

That's largely because the organizations that evolved abroad were tailored to serve parliaments.

Though parliaments can write legislation, they rarely do so, explains van Eijndhoven. Instead, government ministries tend to both write and execute public policy. Moreover, government officials and the majority of members of parliament often belong to the same party—working together to exert their will over that of smaller, opposition parties.

As a result, says Bruce Bimber of the University of California, Santa Barbara, "parliamentary legislators lack the imperative for independence and ability to conduct their own analysis that Congress has."

Christine Mironesco, a political scientist at the University of Geneva, agrees. "The division of power [between those who make and execute laws] is a European idea which has always been more successful in America." In a book due out next year, she argues that the greater the separation between those powers, the more likely a federal technology assessment organization is to be successful.

Her research also suggests other complications. For one, she maintains that many technology assessment studies performed on her side of the Atlantic are less objective than OTA's have been. They either fall into boosterism, extolling a technology's benefits, or take a moralistic tone, focusing on its inherent risks.

"In many ways," argues Bimber, who is also completing a book on OTA, this agency "was a uniquely American institution."

Politicians have never lacked information. If anything, they're deluged with facts, opinions, and recommendations—usually delivered by people with a vested interest in their use. What legislators have always sought is some sieve to filter out ungrounded claims and to identify the often competing desires of major interest groups that should be considered while shaping technology-dependent policies, be they tax credits for private research investments or patent rights for gene fragments that may be used in disease diagnosis (SN: 9/4/93, p.154).

Harvey Brooks, now professor emeritus at Harvard University's John F. Kennedy School of Government, chaired a panel for the National Academy of Sciences in 1969 that wrote the paper which served as the basis for OTA's design.

In retrospect, says Brooks, bipartisan oversight probably proved OTA's most important feature. The House and Senate were represented equally on OTA's governing board, as were Republicans and Democrats; the chairmanship rotated frequently. This makeup required OTA's analysts to take a stance squarely in the middle of any issue. That's "one reason the agency achieved fairly high credibility, both with the public and Congress," notes Brooks.

OTA's "most important function," he believes, "was its restructuring of the issues—asking the right question."

Veteran OTA analyst Robert Friedman agrees. The agency responded to requests from committee chairmen and ranking minority members only. "And almost always their requests were too global," he recalls—such as one around 1980 asking OTA to report back in a year on impacts of altering the atmosphere.

"Our first task was always to redefine and focus these questions into something that was answerable," Friedman says. In this case, OTA and its board identified two principal concerns implicit in the request—the effects of acid rain and

greenhouse gases—and recognized that acid rain concerns were likely to dominate the congressional calendar first. "So we said we would start with a report on acid rain and defer global warming." The resulting report emerged in plenty of time to lay out issues for the Clean Air Act's treatment of acid rain in 1990.

For most people, OTA was essentially a production mill for comprehensive policy tomes. But "what's between the covers of the report wasn't where we made our biggest impact. It was in the ongoing interactions we had with [congressional] staff and the policy community" while researching issues, argues David H. Guston, a political scientist at Rutgers University in New Brunswick, N.J.

"OTA didn't have the smartest analysts of policy. It didn't have the most noble or public-spirited analysts in Washington. But it had an institutional formula that led it to consistently produce nonpartisan, well-balanced studies," says Bimber.

That formula involved holding workshops or otherwise consulting all major parties with a vested interest in an issue to identify what was important to them and why. Many times, Guston says, meetings between stakeholders, Congress, and OTA staff "provided an opportunity for these constituencies . . . to iron out their differences." These behind-the-scenes interactions "often structured much of the way a debate took place," says Don E. Kash of the Institute of Public Policy at George Mason University in Fairfax, Va.

To Guston, this will remain one of OTA's most important, if least recognized, legacies.

In the long run, however, Kash believes OTA's most enduring legacy will be its encyclopedia of reports. For example, the Oklahoma City bombing earlier this year rekindled interest in taggants—agents to help detect explosives or to identify their maker, even after detonation has occurred. These discussions frequently cited OTA's 1980 report on the subject, Kash notes, because "it's still the state-of-the-art document."

Where will Congress turn for such studies now? Sen. Connie Mack (R–Fla.) offered that lawmakers might direct their queries to the Congressional Research Service.

Rep. Amo Houghton (R–N.Y.) scoffs at the suggestion: "OTA is to CRS what fundamental research is to engineering development." Guston agrees. "Through OTA, Congress had in-house access to novel analysis," he says. OTA could develop answers to questions that might never have been asked or written down. Such contemplative ventures took time—often 12 to 18 months—and limited the number of projects OTA could tackle in a year to about 50.

In contrast, Bimber notes, with a budget roughly three times that of OTA, CRS responds to some 500,000 requests annually from members of Congress. "And in the vast majority of cases, it provides its answers within 24 hours."

So for in-depth analyses, he believes, "Congress will have to increase its reliance on people with a stake in the outcome. And that's bad news."

Even analyses by the National Academy of Sciences may reflect biases, charges Roger Herdman, OTA's last director. NAS panels typically enlist academic scientists "who are supported heavily by the federal government—and obviously have an interest in those programs—whereas people at OTA weren't financed by anything but the U.S. Congress."

Moreover, Friedman offers, "Our goal was policy advice to Congress, and that's not necessarily scientific advice." To illustrate the distinction, he said, NAS is equipped to tackle issues such as "How do we define a wetland?" OTA would take on "What can we do about wetlands protection?"

The bottom line, Bimber says, is that there was only one OTA. "It was a wonderful experiment in creating a disinterested source of expertise inside government.

"That's rare—and what we'll miss." □

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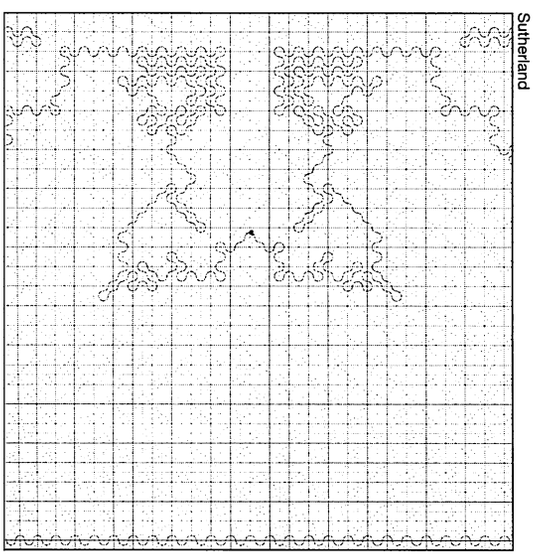
Rümmler, a mathematician working as a computer programmer at an insurance company in Göttingen, Germany. Limitations of the computer system to which he had access forced him to look for another way of representing an ant's movements on a computer screen.



Sutherland

Highlighting the principal contour in the universe of a four-state ant (rule LRRL) at step 38,836 shows the underlying symmetry of the ant's path.

Instead of using blocks of color or shades of gray to represent the state of each cell, he marked the squares with two quarter circles in opposite corners. Arrows showed the direction of travel for either a left turn or a right turn.

Such squares are known as Truchet tiles. Positioned next to each other to form a grid, they join together in such a way that the markings create circles and wavy curves across the plane (see illustrations).

"We get an entirely different way of visualizing what a virtual ant does," Propp says. In essence, the ant follows whatever curve it's on, flipping or not flipping a tile as required by its program when it leaves one cell for another.

From the patterns of the curves winding from cell to cell, it was easier than before to tell where the ant had been—and especially where it was going. The curves enabled Rümmler and others to see that, between the moments when a symmetrical structure appears in the ant's universe, the symmetry is not completely destroyed; rather, it goes "underground," only to reappear a moment later in a larger pattern.

In other words, the recurrent emergence of symmetry is embedded in the curved tracks of a curiously switched railroad that the ant simply follows.

Propp, Troubetzkoy, Scott Sutherland of the State University of New York at Stony Brook, and David Gale of the University of California, Berkeley, describe these insights into the ant's behavior in the summer MATHEMATICAL INTELLIGENCER.

Many mysteries of the ant universe remain unsolved. Lots of variations of the basic rules and the distribution of initial states haven't been explored. No one has looked seriously at virtual ants traversing a three-dimensional lattice of cubes.

Propp himself has started thinking about ant behavior on a field of hexagons. "I played with this during the summer on a courtyard with hexagonal tiles and little stones to mark the states," he says. "I got nice, symmetric patterns—in some ways, prettier that those of the [checkerboard] ant."

It's all part of the wonders of ants on the move. □

Interested readers can look up virtual ants at Scott Sutherland's World Wide Web site at:
http://www.math.sunysb.edu/~scott/ants/.
Copies of his and Propp's ant simulators (computer programs written in C for Unix-based machines) are also available at that site.