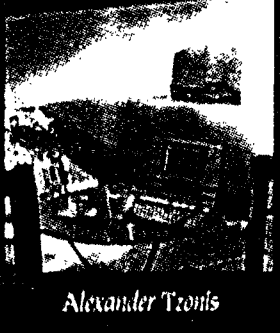


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BOOKS

HERMES
and the Golden
Thinking Machine



Alexander Tzonis

**HERMES
AND THE GOLDEN
THINKING MACHINE**
By Alexander Tzonis
MIT Press, 284 pp., \$19.95

Today's electron-based, digital systems are very good at many kinds of calculations. But there are some calculations that an optical system can handle far better and faster. These are huge sets of simple equations, which a sixth-grader could handle if he had years to calculate all the possible calculations.

Even a supercomputer would struggle mightily, because the number of computations grows explosively with the number of

work goes through such a conversion every 40 to 60 miles, when it meets an electronic repeater. AT&T plans to replace the \$8,000 repeaters, which enhance the signal, with cheaper optic amplifiers. That will reduce the number of these conversions and increase the system's reliability.

This traffic function isn't really optoelectronics. Some optical processors also use light to make calculations. In the mid-1990s, AT&T expects to install new telephone

while optoelectronics is years away from catching up with electronics, its star is shining more brightly these days.

One barrier to the technology is computer memory. It's of little practical use to have the power of optics to, say, "read" a book page by page, if the memory is only handing it out word by word. Researchers appear to be a couple of years away from that breakthrough.

- Laurent Belsie

'Artificial Intelligence' Solves a Mystery

By **Simson L. Garfinkel**

ARCHAEOLOGY, artificial intelligence, and cryptography have little to do with one another, and that is at once both the charm and the problem with Alexander Tzonis's novel "Hermes and the Golden Thinking Machine."

Hermes Steganos is a young professor of archaeology at Harvard University, by all accounts a genius who has succeeded in applying the science of artificial intelligence (AI) and his knack for breaking codes to the decryption of ancient texts.

The Golden Thinking Machine is a priceless artifact, stolen by Hermes's uncle - also an archaeologist - from a recent dig. Hermes sees the machine briefly at the start of his year-long sabbatical in Athens. Hours later Hermes's uncle is murdered and the Golden Thinking Machine stolen. Hermes is the prime suspect. In order to prove his innocence, he must find the killer.

The plot quickly unfolds in this charmingly academic novel about the nature of thought and the history of machine intelligence. The uncle's circle of friends includes archaeologists,

spies, and mystics, all of them erudite, nearly all of them with a secret desire to study - what else? - artificial intelligence.

As Hermes seeks them out, for information or interrogation or help, the subject of the discussion almost invariably turns to search strategies, logical decision trees, problem-solving programs, and reasoning by analogy. As his contacts become more exotic, Hermes becomes more confused.

Meanwhile, back in his apartment, Hermes's beautiful and equally brilliant cousin Nina, herself a student at a nearby university, has a plan.

Using the experimental AI laptop computer that Hermes has brought with him from the United States, Nina is writing an AI "expert system" that will solve the crime. Although she has no formal knowledge of the subject, she is a fast learner and has one of the world's best teachers as her instructor. Nina spends nights talking with Hermes and her days hacking.

Nina's involvement lets Tzonis recapitulate the last 30 years of AI research. Each part of the mystery focuses on some significant tenet of AI, starting with the representation of knowledge and ending with reasoning by analogy. Nina shares the revelations, glories, and failures of such AI

greats as Marvin Minsky and Patrick Winston, experiencing the promise of AI and finally realizing why the science of AI has still not yet come up with the goods.

At times, "Hermes and the Golden Thinking Machine" has the feel of a professor's nightmare gone haywire - not surprising, since Tzonis taught at Harvard from 1967 to 1981. Thankfully, he never uses his characters' interest in AI as an excuse to lecture the reader about the field. Instead, the novel uses artificial intelligence the way that "Mutiny on the Bounty" uses sailing: The subject is an ever-present back-

drop, but many of the references remain unelaborated.

For the reader knowledgeable about AI, the novel comes across as a coffeehouse discussion among greats in the AI field, each making use of the ideas and methods for his or her own ends.

For the reader unfamiliar with the discipline, the mystery makes a wonderful and painless first introduction to artificial intelligence. A reading list in the back shows inquisitive readers where to go for more rigorous treatments of the subject.

■ *Simson L. Garfinkel writes on science and technology for the Monitor.*

The Journey Metaphor

'BEHIND most problem solving methods stand the metaphors, 'getting things done is a journey,' 'method,' 'way through' - the words reveal the journey metaphor. The metaphor makes us look at the process of carrying out tasks in terms of moving in space, a labyrinth, a thick forest, a cave, a tree with branches, a pebbled beach, a region with scattered towns.... Metaphors are a way of finding a representation for a problem. They offer solutions to the problem of how to represent a problem, and the journey metaphor is the representation of problem solving. Much of our everyday thinking about carrying out tasks and discovering solutions is organized in our minds by representations drawn with the help of the journey metaphor."

- From 'Hermes and the Golden Thinking Machine'