UFO UpDates Mailing List

Some scientists don't shut eyes to the 'unknowable'

From: **RSchatte@aol.com [Rebecca Keith]**
Date: Tue, 3 Feb 1998 16:25:38 EST
Fwd Date: Tue, 03 Feb 1998 18:39:05 -0500
Subject: Some scientists don't shut eyes to the 'unknowable'

http://www.chron.com/content/chronicle/nation/98/02/02/unknowability.2-2.html

11:15 PM 1/31/1998
Discovery
Some scientists don't shut eyes to the 'unknowable'
Researchers attempting to confront the limits to human wisdom

By SARAH BOXER
New York Times

Many scientists are not fond of the idea that there are things in the universe beyond their grasp.

They do not even like the word "unknowable" and prefer to use the term "intractable" instead. They consider the idea of unknowability an admission of defeat or an invitation for an attack on science.

Recently, though, some scientists have made unknowability their business. Last summer the Alfred P. Sloan Foundation gave some $1.5 million in grants to researchers in different fields -- economics, oceanography, historical linguistics, computer science, population genetics, cell biology, anthropology and the history of science -- to take stock of what is known, unknown and unknowable.

"We are all taught what is known, but we rarely learn about what is not known, and we almost never learn about the unknowable," Ralph Gomory, the president of the Sloan Foundation, wrote in Scientific American in 1995. "Because of such lessons, we grow up thinking more is known than actually is," and we do not recognize the unknowables for what they are.

That is why the average gambler always loses to the average casino owner. "The gambler attempts to predict the individual and unpredictable spins of the roulette wheel," Gomory wrote, while "the owner concerns himself with the quite predictable average outcome."

This is not the first time the depths of unknowability have been plumbed. As John Barrow, an astronomy professor at the University of Sussex in England, writes in Impossibility: The Limits of Science and the Science of Limits (Oxford, coming in April), Heisenberg's uncertainty principle showed that you cannot simultaneously know the position and momentum of a subatomic particle.

Einstein's cosmic speed limit put a cap on the transmission of

information in the universe. And Goedel's theorem proved that any mathematical system that is powerful enough to be interesting will contain statements that cannot be proved true or false inside that system.

More recently, chaos theorists have looked at phenomena like dripping faucets and long-term weather patterns, and shown how the tiny inevitable fluctuations in those chaotic systems quickly snowball in unpredictable ways. Complexity theorists have shown that complicated systems, like embryos and economies, are more than the sum of their parts.

Now unknowability itself seems to be coming of age, or at least coming into some money.

So what is an example of something unknowable? Take the diet of a given person living in a village in the year 1300. "You may know on average what his diet was," said Jesse Ausubel, the program officer of the Sloan Foundation. "But you cannot say what he ate on Dec. 15, 1300."

The same goes for future climates. You may be able to say what the average temperature of the Earth's atmosphere will be in 2030, but you cannot know what it will be in New York City.

The study of unknowability in each discipline offers a glimpse of how different scientists approach the boundaries of their own fields.

In anthropology, the limits to knowledge can be determined by practical barriers. If a group of people refuses to perform a ritual while an outsider is watching, that ritual is, in a sense, unknowable. In science history, the knowledge about a problem can be limited by illegible handwriting or some other fluke.

No one will ever know, for example, exactly how Fermat proved his last theorem because, by his own admission, the margin of his page was "too narrow to contain" the solution.

In ecology, unknowability is a problem of scale. If, for example, one wants to see the effect of environmental changes on a forest, one literally has a choice between looking at the forest and looking at the trees.

Simon Levin, a biologist at Princeton University who has received part of the Sloan's unknowability grant, said that when you look at the climate's effect on the forest, "not every detail of every tree is important." What the study of unknowability can help reveal is how much detail you can leave out about individual trees without compromising your knowledge of the whole forest.

Or say you are starting with a single tree. As Levin points out, each tree will react differently to environmental changes and to other trees, and that tree's reaction in turn will have an effect on the climate. So how much can you extrapolate from that one tree about the whole forest?

When it comes to unknowability in historical linguistics, time is the enemy.
To name the unknowable is to name a date beyond which the past is irretrievably lost.

According to Colin Renfrew, an archaeologist at Cambridge University who is another recipient of a Sloan grant, the first direct evidence of language is around 3000 B.C., because that is when writing began, in the Near East. So if you want to see what language was like before then, you run up against the boundary of what is knowable and not knowable.

By comparing contemporary Indo-European languages (including English, Spanish, French and German), linguists have reconstructed what they call proto-Indo- European, a precursor to all Indo-European languages, Renfrew said. That takes us back to 5,000 years ago.

But to push back the date further requires help from other fields. For example, Renfrew said, we know that languages spread when populations shift.
That means archaeology should say something about language. And DNA studies tell us a great deal about how populations are related, going back some 30,000 years.

```
The problem is, "it is difficult to correlate data from different
fields," Renfrew said. "There is always the possibility of
dubious interpretations," which gets more and more likely the
further back in time you go. That's why most linguists accept
that we can see back at least 5,000 years, but few think we can
detect the echoes of a hypothetical first language some 80,000
years ago.
```

Search for other documents to/from: rschatte

[Next Message | Previous Message | This Day's Messages]
[This Month's Index | UFO UpDates Main Index | MUFON Ontario]

UFO UpDates - Toronto - updates@globalserve.net
Operated by Errol Bruce-Knapp - ++ 416-696-0304

A Hand-Operated E-Mail Subscription Service for the Study of UFO Related Phenomena.
To subscribe please send your first and last name to updates@globalserve.net
Message submissions should be sent to the same address.

[UFO Topics | People | Ufomind What's New | Ufomind Top Level]