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Pity the Scientist Who Discovers the Discovered

By GINA KOLATA

IN 1996, Rakesh Vohra, a professor at Northwestern University, and his colleague Dean Foster published "A Randomized Rule for Selecting Forecasts," a paper in the journal Operations Research. It illustrated how a random investor could outperform a group of professional stock pickers simply by following a "buy and hold" investment strategy.

It was important research, the authors believed, until they learned that the same discovery had been made at least 16 times since the 1950's. And no one, Dr. Vohra said, ever realized they were not doing original work.

The discovery that your discovery has already been discovered is surprisingly common, said Stephen Stigler, a statistician at the University of Chicago who has written about the phenomenon. Not only does it occur in every scientific field, he said, the "very fact of multiple discoveries has been discovered many times."

The result of duplicative research may be no more serious than chagrin over wasted time. But in other cases, say those involving medical research, there can be a real risk of harm to patients.

It may seem odd that scientists in the Internet age spend years on a line of research, even bet their careers on it, without having first determined that their mountain had not already been climbed. But Dr. Stigler said that scientists often are ignorant of the work being done by others in their field, and searches of scientific literature can be hard to conduct. Web search engines, for example, look for words, not ideas, and Dr. Vohra said he discovered that every researcher who had made his discovery had given it a different name and description.

In 1957, for example, a statistician named James Hanna called his theorem Bayesian Regret. He had been preceded by David Blackwell, also a statistician, who called his theorem Controlled Random Walks. Other, later papers had titles like "On Pseudo Games," "How to Play an Unknown Game," "Universal Coding" and "Universal Portfolios," Dr. Vohra said, adding, "It's not obvious how you do a literature search for this result."

In a recent paper in Clinical Trials, Dean Fergusson, an epidemiologist at the Ottawa Health Research Institute in Canada, and his colleagues found 64 clinical trials had been conducted on the drug aprotinin, all asking if patients who received it during surgery had fewer transfusions. The answer was always yes.

It is easy to see why these studies were done, said Dr. Steven Goodman, an epidemiologist at Johns Hopkins University and an editor of Clinical Trials. Nearly all were so small, with perhaps a few dozen subjects, that they did not need a sponsor to finance them.

"They are already doing surgery and the drug is used at the discretion of the surgeon," Dr. Goodman said. "The only cost is maintaining a small database."

But Dr. Goodman said the larger issue is whether later medical researchers who studied aprotinin erred in giving placebos to some patients when there already was research showing that the drug resulted in fewer transfusions.

"It's a double betrayal," he said, "first to ignore the contribution of patients in past studies and then to ask for the same contribution from future patients."

Moreover, he said, in this case researchers could have found all the previous studies simply by typing "aprotinin" into a medical database.

In addition, despite the previous studies, a recent statistical analysis of 4,374 patients, led by Dr. Dennis T. Mangano of the Ischemia Research and Education Foundation in San Bruno, Calif., found that aprotinin may increase the risk of heart attacks, strokes and kidney failure. The statistical evidence that led to this conclusion, however, could not have shown up in the many small-scale studies of the drug.

But Dr. Gregory Nuttall of the Mayo Clinic said that while it may seem that the time for using placebos in aprotinin studies had come and gone, that question "is never as cut and dried as it seems."

"Just because something works in one type of surgery doesn't mean it works in another," he said. "Different surgeries have different risks for bleeding and different risks for having blood clots."

Dr. Nuttall did look at the aprotinin literature, he said, and suspects that other doctors who studied the drug did so, too. But it was not always obvious from the study results, he said, that aprotinin was beneficial.

Finally, there is one more problem with duplicative science. It's about credit. Who gets it?

Dr. Stigler notes that renowned scientists have often been credited with results achieved first by others. This goes back to Pythagoras, he said, and includes august figures like Fourier and Laplace, as well as household names among mathematicians, like Cauchy and Chebyshev.

Of course, it can be embarrassing to learn that your discovery isn't one. But the best defense may be a good offense.

For example, there is the oft-told story about Larry Shepp, a famous mathematician at Rutgers University. Dr. Shepp, when told that a piece of work he thought was his discovery actually duplicated another mathematician's breakthrough, replied: "Yes, but when I discovered it, it stayed discovered."