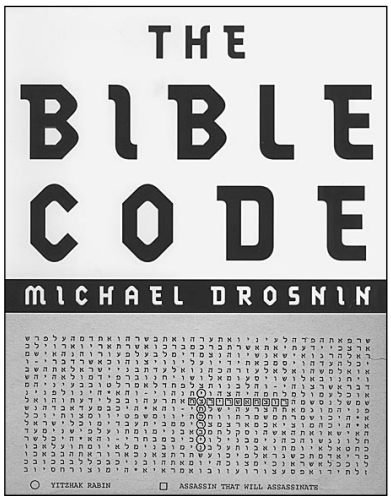
The Bible Code

Reviewed by Allyn Jackson

Commentary by Shlomo Sternberg



The Bible Code
Michael Drosnin
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Michael Drosnin has written a frightening book. Nuclear holocausts, calamitous earthquakes, the Nazi death camps, terrorist bombings, assassinations of world leaders who may have held some hope for humanity—a 182-page catalogue of very real threats to our world.

The Bible Code purports the existence of a hidden code in the Hebrew text of the Old Testament. This code, according to Drosnin, contains information about future events—especially, it would seem, tragic world events of monumental proportions. The book appeals to legitimate fears about irrational, violent forces loose in the world. These fears can lead rational people to hope that God will intervene where humans fail. They may even inspire hope that this book really does provide a way of predicting the future and averting disaster.

The sad fact is that this book is a series of wild, unfounded claims based on stretching statistical evidence to the breaking point. Drosnin, a former reporter for the *Washington Post* and the *Wall Street Journal*, says he is simply a journalist in search of the facts: "I started out on the night police beat. I always had a very flat-footed, down-to-earth view of reality. And I was determined to deal with this story the same way I dealt with every other story." But despite his claims to hard-nosed skepticism, one cannot avoid the conclusion that he lacks the mathematical and statistical background that would bring some depth to his skepticism. He is deluded by his ignorance.

Efforts to extract hidden information from the Bible are as old as the Bible itself. One method is the use of equidistant letter sequences (ELSs), or skip codes: Start with a given letter in the text, and then repeatedly skip a fixed number of letters, ignoring spaces between words. For example, the first sentence of this paragraph, starting with the first letter and using a skip code of 3, would yield the equidistant letter sequence ERORHEFANMBEADHBTF. This process can also be visualized as eliminating all of the spaces between the words in the Bible and arraying the letters into a grid, where the number of letters in any row of the grid is the length of the skip. Vertical lines in the array then constitute ELSs in that skip code.

In the 1940s and 1950s, Rabbi H. M. D. Weissmandel used skip codes to study the five Books of Moses. His work was the starting point for explorations that resulted in the paper "Equidistant Letter Sequences in the Book of Genesis", by Doron Witztum, Eliyahu Rips, and Yoav Rosenberg (Statistical Science **9** (1994), 429–438). Witztum is a physicist, and Rosenberg is a computer programmer; Rips is a well-known group theorist at the Hebrew University of Jerusalem. Their paper undertook a serious statistical approach to investigating skip codes in the Book of Genesis. *The Bible Code* claims to be based on this work but actually mis-

uses the results in ways the authors seem not to have intended.

The paper begins with the following idea. Suppose you have a text in a foreign language and you are given a small set of related words in that language (for example, "hammer" and "anvil"). Can you decide whether the text is meaningful or gobbledegook? The question is not whether you can translate the text; the word list you are given is too short for that. Rather, the question is, Can you use statistical analyses of the proximity of the related words to uncover structure in the text that will tell you whether it has meaning? This is the approach the authors take to the skip-coded material gleaned from Genesis.

They define mathematically a way of measuring the "distance" between encoded words and statistical measures of "how close together" sets of encoded words are. The measures incorporate the notion that encoded words found with close to minimal skips are more significant than those found with very large skips. They ran experiments on two samples: One consisted of the names of 34 historical figures in Judaism and their birth and death dates; the other had the same information for a different set of 32 historical figures. For each sample they created a set of 1,000,000 different permutations of the names with the dates by taking 999,999 random matchings plus the one correct matching. The methods they developed allowed them to measure the "distance" between the list of names and the list of dates in each of the permutations.

The results are striking. For example, with the set of 32 names and dates, only 3 of the 1,000,000 permutations had a shorter "distance" between them than the correct matching of names and dates. Overall, the authors calculate that the probability of obtaining the results they did is 2/10000. The conclusion the authors draw is much more restrained than anything in *The Bible Code*: "We conclude that the proximity of [equidistant letter sequences] with related meanings in the Book of Genesis is not due to chance."

Because of the unusual nature of the paper, it was put through an especially lengthy review process. After it appeared, Harold Gans, a retired cryptologist with the National Security Agency, independently repeated and confirmed the results and found similar phenomena with other sets of data. However, some have raised questions about the paper. Brendan McKay, a mathematician at Australian National University, has criticized the methodology and says that a correct approach leads to far less impressive results. McKay and three colleagues tried to reproduce the paper's results and obtained insignificant findings (see the Web page `http://www.math.gatech.edu/~jkatz/Religions/Numerics/report.html`). McKay and Dror Bar-Natan, a mathematician at the Hebrew University of Jerusalem, are preparing a paper detailing their findings (the paper will be submitted to a journal and will also be posted on McKay's home page, `http://cs.anu.edu.au/~bdm/`).

Whatever the shortcomings of the *Statistical Science* paper, the authors at least made an effort to formulate a quantitative approach and a well-defined experiment. *The Bible Code*, while asserting that it is based on the paper, makes no attempt to emulate its rigor and objectivity. Drosnin clearly spent a great deal of time with Eliyahu Rips, who is a major figure in the book. Rips, Witztum, and Gans have publicly denounced the book's conclusions, but Rips has not denied the accuracy of the many passages in which he is quoted. If the descriptions in the book are accurate, Rips, like Drosnin, was enthralled by hunting through the "hidden text" of the Bible for hints about world events. However, Rips avoids asserting that one can predict the future this way. Drosnin tries to add legitimacy by quoting other prominent mathematicians, such as Robert Aumann, David Kazhdan, and Ilya Piatetski-Shapiro. Reading carefully, however, it appears that their statements of surprise at and confirmation of the code pertain to the work of Witztum et al., not that of Drosnin.

The main problem with the *The Bible Code* is that it suffers from the "I-know-it-when-I-see-it" approach. Rather than specifying beforehand what information he is looking for and then assessing what he did and did not find, Drosnin appears to have simply pored over thousands of arrays of skip-codings of the Bible and picked out what seemed interesting and plausible. One of the central examples in the book (dredged up time and again whenever Drosnin feels the need to shore up the reader's confidence in what he is doing) is the "prediction" of the 1995 assassination of Yitzhak Rabin. In 1994 Drosnin found Rabin's name in the code, crossed by the words "assassin will assassinate"; the year corresponding to 1995–96 in the Hebrew calendar appeared nearby.

Through an intermediary, Drosnin communicated a warning to Israeli officials. Certainly they knew that Rabin—the prime minister of a country marked by conflict and bloodshed, the architect of a nascent and highly controversial peace plan—was a potential target for assassination. It was a shock, but not quite a surprise, when he was killed. Although Drosnin's warning seems to have been taken seriously, he had no precise details about when or where or under what circumstances the assassination might take place. Nevertheless, he tries to portray the prediction as highly detailed: "[T]here were details as precise as the story reported on CNN," Drosnin exults: "the full name of Rabin, the name of his assassin, the year he was killed—all but Amir [the name of the assassin] found before it happened." Drosnin also found

references to the assassinations of Robert F. and John F. Kennedy and Anwar el-Sadat. Alas, Witztum, in his statement denouncing *The Bible Code*, also points out that one can find the assassination of Winston Churchill similarly encoded.

The Bible Code contains many graphical displays of arrays of Hebrew letters, with the words indicating the predictions circled and translated. Those who do not read Hebrew are at Drosnin's mercy when it comes to the meaning and interpretation of the words—a particularly worrisome notion given that many Hebrew words have multiple meanings in English. The translations are not even consistent throughout the book. For example, the words accompanying the name "Yitzhak Rabin" are variously translated as "assassin will assassinate", "assassin that will assassinate", and "assassin who will assassinate". In a Web posting Gans asserts that the correct translation is actually "murder" rather than "assassinate" and that one could interpret this finding as implying that Rabin was a murderer—a view that some, rightly or wrongly, did hold.

Another problem with *The Bible Code* is that Drosnin gives no explanation of how he applied the methods of the *Statistical Science* paper. For each of the 1,000,000 permutations of the names and dates, the paper provided a ranking based on how "close together" the names and dates appeared. How does this method carry over to calculating the odds of finding "Prime Minister Netanyahu" running across "Surely he will be killed"? "[Netanyahu's] death was not as clearly predicted as Rabin's," Drosnin warns. "The odds that it would be encoded with his name were 100 to 1. The Rabin assassination was encoded against odds of 3000 to 1." What exactly do these probabilities mean? Later on, in trying to explain that the Bible code does not really predict the future (while spending much of the book trying to persuade us that it does), Drosnin tells us that the code "may be a set of probabilities." Are these probabilities that actual events will occur? Or are they probabilities that related words will appear near each other in the code? He never makes it clear.

Not all of the predictions in *The Bible Code* are disastrous. Drosnin found the name "Edison" encoded near "light bulb" and "electricity", and "Newton" encoded near "gravity". But such examples are few; Drosnin clearly prefers prophecies of death and destruction. He manages to instill a fearful awe in the reader through this litany of disasters, but he also ends up undercutting his tone of seriousness by a predilection for bloated, portentous statements: "It was like the pieces of a puzzle coming together, slowly, inexorably completing some horrible picture." "The countdown to what could be the real Armageddon was coming to an end." "[T]he ultimate danger we face may be the greatest natural disaster mankind has ever witnessed."

The major prediction in the book is that World War III will start with a nuclear attack on Israel. Drosnin rightly points out that such an attack is a chillingly real possibility, given that Israel has plenty of enemies and given the increasing availability of the means to create nuclear weapons. He also found in the Bible code the return of the comet Swift in the year 2126, just as astronomers have predicted. He foretells a major earthquake in Los Angeles in 2010—a prediction bolstered by the well-known seismological fact that California is prime earthquake country. Drosnin covers his rear-end by sticking to plausible scenarios that everyone already knows could happen.

In fact, the way Drosnin has rigged things, he will turn out to be right no matter what. When his

At http://cs.anu.edu.au/~bdm/BH825.txt/ one can find the full text of the U.N. Convention on the Law of the Sea, signed in 1982. We shall look for messages encoded in this document. To make the experiment somewhat Hebrew-like, we will ignore all vowels and treat upper- and lowercase letters as the same.

This document (stripped down to its consonants) has some remarkable ELSs. The probabilities I will give are those of finding EVEN ONE example in a text formed from this by randomly shuffling the letters.

This Convention is a primary source of international law relating to oceans and waterways. In fact, if you read it, you

> HeaR aLL THe LaW oF THe Sea (start=190588, skip=-15290, prob=0.000095).

(In other words, the probability that this sentence appears in the document at all is 95 out of one million.)

Many other ELSs of very low probability can be found, but I will content myself with exploring this question: Why was this Convention signed? The cynic might say it was just that

> NaTo NeeD aN aGReeMeNT oN THe Sea (start=88311, skip=3404, prob=0.000021),

but the truth is more mundane. After all, the world fishing industry benefits more than anyone. Yes, this was just a

> SaFe uN oCeaN CoNVeNTioN To eNCLoSe TuNa (start=144491, skip-2066, prob=0.000000001)

(i.e., one in 1 billion).

I have found very good "predictions" of famous assassinations in the English text of *Moby Dick* (including vowels). This meets a direct challenge by Mr. Drosnin. Included are Trotsky, Ghandi, Robert Kennedy, and ten others. Each is at least as good as Mr Drosnin's example. Of course, I also have a "prediction" of the murder of Drosnin himself.

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prediction for an "atomic holocaust" of Israel in 1996 did not pan out, he found the word "delayed" encoded near the prediction. "Why didn't the Bible code just tell the one real future?" he asks. "The answer appears to be that there isn't just one real future; there are many possible futures." So if Drosnin is right about the future, he is an amazing prophet; if he is wrong, we just happened to get a different future that time. He also tries to bolster these unsupportable ideas with appeals to chaos theory and quantum physics. By the end of the book it becomes clear that, behind the facade of reportorial tough-mindedness and appeals to the objectivity of science and mathematics, Drosnin harbors dreams of becoming the prophet of our age. He believes he is the one to uncover the secrets in the book sealed by the Old Testament figure, Daniel. This is sacrilegious folly.

Drosnin has appeared on *Oprah*, and he has sold the movie rights to Warner Brothers. The book has hit the bestseller lists of the *New York Times*, the *Times of London*, *USA Today*, and *Publisher's Weekly* and has been written up in major newspapers and magazines (not to mention getting front-page coverage in the tabloid paper, the *National Examiner*, along with a story on the marital problems of Frank and Kathie Lee Gifford). There is also a good deal of discussion of *The Bible Code* on the World Wide Web.[1] Generally the press has not been favorable, but the "reader reviews" on the Simon and Schuster home page were nearly all positive, with an average rating of 7.6 out of 10. (Then again, there are readers like Marilyn Glads, who posted this review: "This book freaked me out. I now know why I hate math and religion.")

Mathematics already has a public relations problem in that many people believe the field is a bag of tricks used to torment schoolchildren. Will readers of *The Bible Code* now conclude that what mathematics is *really* good for is doomsday prophecies? Most of them do not have the background in statistics and mathematics to be able to see the holes in Drosnin's arguments. But some may swallow *The Bible Code*, holes and all, just because it appears to offer a shred of hope for salvation from the many dangers our world faces.

[1] *A good place to start is* `http://yahoo.com/news_and_Media/Current_Events/Bible_Code_Controversy/`.

Comments on *The Bible Code*

Shlomo Sternberg

The Bible Code by Michael Drosnin exploits a hoax perpetrated by two Israelis, E. Rips and D. Witztum, which purports that there are messages about the future encrypted in the Hebrew text of the Bible—codes which can only be deciphered by computer. It is easy to give a concise explanation of why this is a hoax, and so I shall do so here.

First of all, the "decoding of these hidden messages" depends on the letter-for-letter accuracy of the current electronic (Koren) version of the Bible as being the "original Hebrew version". This is simply not so. This is not a matter of belief, but a matter of fact: Orthodox Jews, for example, hold the Talmud in extremely high regard. But any serious student of the Talmud knows that there are many citations of the Hebrew Bible which indicate a differing text from the one we have. In the Five Books of Moses these come to about one hundred discrepancies. One of the oldest complete texts of the Bible, the Leningrad codex (from 1009) (also available electronically) differs from the Koren version used by Rips and Witztum in forty-one places in Deuteronomy alone. In fact, the spelling in the Hebrew Bible did not become uniformized until the sixteenth century with the advent of a printed version that could provide an identical standard text available at diverse geographical locations.

Second, "hidden messages" similar to those of Drosnin, Rips, and Witztum can be produced in any sufficiently long actual text, and such have in fact been produced.

These two arguments apply equally well both to Drosnin's book and to the paper that appeared

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in *Statistical Science*, obviously the result of sloppy refereeing and poor editorial policy. So there is no reason to distinguish between the two as Ms. Jackson does in the accompanying article.

What does this sordid affair have to do with mathematics? Nothing, so it would seem. So why does a review of Drosnin's book appear in these pages?

A first possible reason might be that Rips is a professor of mathematics at the Hebrew University. So what? It is not a crime to perpetrate a hoax, at least according to American law with our free market in goods and ideas. Quite the contrary! But even if it were a crime, why should the AMS be interested? For example, the man accused of being the Unabomber holds a Ph.D. in mathematics. I have not seen a campaign mounted in these pages for a defense fund on his behalf so as to spare our community the indignity of having one of our Ph.D.s convicted of murder.

A second possible reason is that three prominent mathematicians—D. Kazhdan, I. Pyatetski-Schapiro, and R. Aumann—are cited in the book as authorities who believe in these "codes". Even if these citations are true, again, so what? If it is not a crime to perpetrate a hoax, it is not a crime to be duped by a hoax or to promulgate it.

I think that I can narrow in on the reason by observing that no academic of remotely comparable credentials in any field other than mathematics is brought as support for these "codes". No linguist, no Bible scholar, no computer scientist, no statistician. The impression given by the book, and reinforced by the massive international publicity campaign surrounding it, is that it is the domain of mathematicians using their mathematics to pass judgment on the veracity of the claims made by the perpetrators.

Are Drosnin and his publicists responsible for the outrageous idea that mathematics is somehow involved in this puerile nonsense? Here, alas, the answer is in the negative. Several years earlier, Witztum published a book (in Hebrew) explaining the "codes". An introduction was written by four distinguished mathematicians: J. Bernstein, H. Furstenberg, D. Kazhdan, and I. Pyatetski-Schapiro. It is true that the encomia given by these eminent men (at least in the English-language version of the introduction) were of a limited nature: "This is serious scholarship, worthy of further investigation, etc." But the very fact that they banded together to form a committee consisting solely of mathematicians in writing their introduction in and of itself has given rise to the widespread notion that this enterprise is supported by mathematics. In so doing they have not only brought shame on themselves, they have disgraced mathematics.