

Consider the numbers up to 500,000, a figure that's generally taken to be an upper bound for the number of hairs on any human head, and imagine these numbers to be the labels on half a million mailboxes. Imagine further that each of the 2.2 million Philadelphians is a letter to be delivered to the mailbox whose label corresponds to the number of hairs on his or her head. Thus, if Mayor Wilson Goode has 223,569 hairs on his head, then he is to be delivered to the mailbox with that number.

Since 2,200,000 is considerably more than 500,000, we can be certain that at least two people have the same number of hairs on their heads; i.e., that some mailbox will receive at least two Philadelphians. (Actually, we can be sure that at least five Philadelphians have the same number of hairs on their heads. Why?)

A STOCK-MARKET SCAM

Stock-market advisers are everywhere, and you can probably find one to say almost anything you might want to hear. They're usually assertive, sound quite authoritative, and speak a strange language of puts, calls, Ginnie Maes, and zero-coupons. In my humble experience, most don't really know what they're talking about, but presumably some do.

If from some stock-market adviser you received in the mail for six weeks in a row correct predictions on a certain stock index and were asked to pay for the seventh such prediction, would you? Assume you really are interested in making an investment of some sort, and assume further that the question is

being posed to you before the stock crash of October 19, 1987. If you would be willing to pay for the seventh prediction (or even if you wouldn't), consider the following con game.

Some would-be adviser puts a logo on some fancy stationery and sends out 32,000 letters to potential investors in a stock index. The letters tell of his company's elaborate computer model, his financial expertise and inside contacts. In 16,000 of these letters he predicts the index will rise, and in the other 16,000 he predicts a decline. No matter whether the index rises or falls, a follow-up letter is sent, but only to the 16,000 people who initially received a correct "prediction." To 8,000 of them, a rise is predicted for the next week; to the other 8,000, a decline. Whatever happens now, 8,000 people will have received two correct predictions. Again, to these 8,000 people only, letters are sent concerning the index's performance the following week: 4,000 predicting a rise; 4,000, a decline. Whatever the outcome, 4,000 people have now received three straight correct predictions.

This is iterated a few more times, until 500 people have received six straight correct "predictions." These 500 people are now reminded of this and told that in order to continue to receive this valuable information for the seventh week they must each contribute \$500. If they all pay, that's \$250,000 for our adviser. If this is done knowingly and with intent to defraud, this is an illegal con game. Yet it's considered acceptable if it's done unknowingly by earnest but ignorant publishers of stock newsletters, or by practitioners of quack medicine, or by television

evangelists. There's always enough random success to justify almost anything to someone who wants to believe.

There is another quite different problem exemplified by these stock-market forecasts and fanciful explanations of success. Since they're quite varied in format and often incomparable and very numerous, people can't act on all of them. The people who try their luck and don't fare well will generally be quiet about their experiences. But there'll always be some people who will do extremely well, and they will loudly swear to the efficacy of whatever system they've used. Other people will soon follow suit, and a fad will be born and thrive for a while despite its baselessness.

There is a strong general tendency to filter out the bad and the failed and to focus on the good and the successful. Casinos encourage this tendency by making sure that every quarter that's won in a slot machine causes lights to blink and makes its own little tinkle in the metal tray. Seeing all the lights and hearing all the tinkles, it's not hard to get the impression that everyone's winning. Losses or failures are silent. The same applies to well-publicized stock-market killings vs. relatively invisible stock-market ruinations, and to the faith healer who takes credit for any accidental improvement but will deny responsibility if, for example, he ministers to a blind man who then becomes lame.

This filtering phenomenon is very widespread and manifests itself in many ways. Along almost any dimension one cares to choose, the average value of a large collection of measurements is about the same

as the average value of a small collection, whereas the extreme value of a large collection is considerably more extreme than that of a small collection. For example, the average water level of a given river over a twenty-five-year period will be approximately the same as the average water level over a one-year period, but the worst flood over a twenty-five-year period is apt to be considerably higher than that over a one-year period. The average scientist in tiny Belgium will be comparable to the average scientist in the United States, even though the best scientist in the United States will in general be better than Belgium's best (we ignore obvious complicating factors and definitional problems).

So what? Because people usually focus upon winners and extremes whether they be in sports, the arts, or the sciences, there's always a tendency to denigrate today's sports figures, artists, and scientists by comparing them with extraordinary cases. A related consequence is that international news is usually worse than national news, which in turn is usually worse than state news, which is worse than local news, which is worse than the news in your particular neighborhood. Local survivors of tragedy are invariably quoted on TV as saying something like, "I can't understand it. Nothing like that has ever happened around here before."

One final manifestation: Before the advent of radio, TV, and film, musicians, athletes, etc., could develop loyal local audiences since they were the best that most of these people would ever see. Now audiences, even in rural areas, are no longer as satisfied with local entertainers and demand world-class talent. In this sense, these media have been good for audiences and bad for performers.