# Mind-survival link emerges from death data

An analysis of recorded deaths in California suggests that deeply held beliefs and attitudes strongly influence the survival times of people who develop most major illnesses, including heart disease, cancer, and emphysema.

"On the basis of our data, it's hard to imagine that psychosocial and psychosomatic processes don't significantly affect longevity for many life-threatening diseases," asserts David P. Phillips, a sociologist at the University of California, San Diego.

Phillips and his co-workers took advantage of disease-related beliefs in traditional Chinese communities for their study. Long-standing Asian medical and astrological teaching holds that combinations of particular birth years and specific diseases prove "ill-fated."

For instance, this belief system holds that people born in a "fire" year — which has 6 or 7 as the final digit — fare worse than others when they develop heart conditions; birth in an "earth" year — ending in 8 or 9 — does not bode well for individuals with diabetes, peptic ulcers, or cancerous growths; and those born in "metal" years — ending in 0 or 1 — deal especially poorly with bronchitis, emphysema, or asthma.

The San Diego scientists examined California death records of 28,169 adult Chinese and 412,632 Caucasian controls, all of whom had died between 1969 and 1990. For each deceased Chinese person in the sample, the researchers generated a random group of 20 deceased controls with the same sex, year of death, cause of death, and astrologically relevant birth year.

Chinese-Americans harboring the strongest commitment to traditional beliefs display three characteristics, Phillips asserts: birth in China, residence in a large city (San Francisco or Los Angeles, in this case), and absence of an autopsy (a procedure shunned by adherents of traditional Chinese medicine).

Overall, Chinese — but not Caucasians — die markedly earlier if they possess an ill-fated pairing of disease and birth year, Phillips' group reports in the Nov. 6 LANCET. On average, Chinese with astrologically undesirable illnesses died from 1.3 years to 4.9 years sooner than Chinese suffering from the same diseases in the absence of an ill-fated birth year.

Ill-fated diseases produced deaths earlier among women than men and among those strongly committed to traditional beliefs, Phillips contends. For Chinese women holding a strong commitment to traditional beliefs, those who were born in an earth year and developed cancer died 3.3 years earlier than other Chinese cancer victims. If traditional Chinese women suffered from bronchitis, emphysema, or asthma and were born in a metal year, they died 8.3 years earlier than all other Chinese with the same illnesses.

Chinese longevity dropped more for acute than for chronic heart disease, suggesting that lack of exercise or poor diet played a small part in the trend, Phillips says. And the longevity decrease for lymphatic cancer far exceeded that for lung cancer, indicating that the findings do not merely reflect lung cancers brought on by cigarette smoking, he notes.

In addition, Chinese suffering from ill-fated diseases did not die abnormally young, suggesting that they were not susceptible to a variety of diseases that boost the likelihood of early death.

The new data coincide with evidence, also collected by Phillips, that death rates rise temporarily just before or after meaningful annual events, such as birthdays or religious holidays (SN: 10/10/92, p.237).

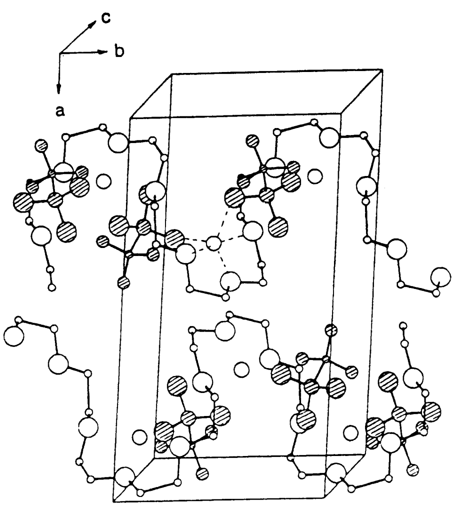
"Phillips' studies show not that you wish yourself to death, but that the course of disease is importantly influenced by your expectations," says David Spiegel, a psychiatrist at Stanford University School of Medicine who has found that breast cancer patients live longer when they attend regular support group meetings (SN: 11/4/89, p.302). *— B. Bower*

# Chargeable polymer shows helical structure

Rechargeable batteries, programmable billboards, windows that adjust how much sunlight beams into a room: To do their respective jobs, certain versions of these devices need specially tailored plastics that can hold a charge.

For many years, scientists have experimented with such charge-holding thin films, called polymer electrolytes, in their quest for better batteries, among other things. But the search for better charge-storing solids — an effort, basically, to do away with the corrosive juices that top off most wet-cell batteries — has been hamstrung by inadequate knowledge about the physical configurations of certain polymers.

Now researchers can get a clearer picture. Philip Lightfoot, a chemist at the University of St. Andrews in Fife, Scotland, and two colleagues report in the Nov. 5 SCIENCE their elucidation of the structure of a common polymer electrolyte — poly(ethylene oxide)$_3$:$LiCF_3SO_3$, which is essentially a salt dissolved in a simple plastic.



*The structure of the polymer electrolyte $PEO_3$:$LiCF_3SO_3$.*

"These materials have been around for 20 years, and yet we've known very little about their structure," says Peter G. Bruce, a coauthor and chemist at St. Andrews. "This missing data has held back polymer electrolyte research."

"For molecular biology to take off, people had to know the crystal structure of DNA," Bruce adds. "This is very similar. Now that we have a picture of this polymer electrolyte's crystal structure, we should be able to design better materials with higher conductivity and direct technological applications."

This material's structure remained unknown for so long because the standard technique for discerning it — a single-crystal method — just didn't work, the researchers state. So they tried another route. Using powder X-ray diffraction, where the sample is crushed up, they found a network of molecular coils, or helixes, with lithium ions bound inside the turns of the coils.

"Seeing how ions fit inside the polymer tells us how to design better electrolytic polymers," Bruce says. The polymers fare best as conductors when they become amorphous, he adds — that is, capable of slow deformation, like glass.

"The motion of the polymer chains helps ions move through the material. So macroscopically we want the polymer to look solid, while microscopically it's really a slow-moving liquid. If made properly, at higher temperatures it gets sticky and stretchy — which is part of what makes it a good conductor."

Better batteries, visual displays, and "smart" windows hinge on solid polymer electrolytes that conduct charge more quickly. "All three of these items are electrochemical cells," says Bruce. "Each has a solid polymer pressed between two electrodes. The goal is to be able to fabricate these kinds of thin films easily and cheaply, just rolling them out a few microns thick in automated production." *— R. Lipkin*