Briefings

edited by MARK H. CRAWFORD

Biomedical Dollars and Body Counts

An amendment slipped into the NIH appropriations bill last month by Senator Bill Armstrong (D–CO) sounds innocuous enough, but it is raising an old specter: should biomedical research priorities be set primarily by the number of people who die from specific diseases?

Armstrong's amendment requires the Department of Health and Human Services to report on the leading causes of death in the United States and how much money is being spent to fight each killer disease.

Increasingly controversial among some scientists, for example, is the level of spending on AIDS research. AIDS accounted for 5.5 deaths per 100,000 in 1987; research on the disease is slated to rise to $750 million this year. In contrast, heart disease caused 312 deaths per 100,000, but received $1.1 billion in research funds. A preliminary review of the statistics, says Armstrong, "raises questions about our spending priorities."

Shroud Resurrected

The Turin Shroud: was it a cloth that covered the body of Jesus—or a 14th-century fake? You may have thought science had laid that question to rest, but that was by no means apparent at the International Symposium on the Shroud of Turin held in Paris recently.

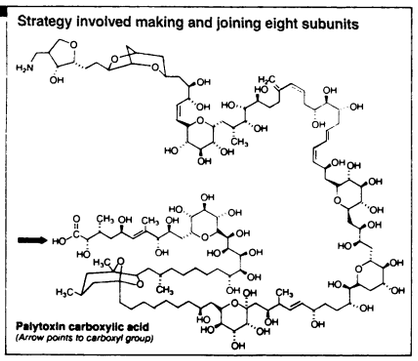
The shroud is a linen cloth with faint images, like a photographic negative, of a man with stigmata-like wounds. The first historical mention of the shroud dates to 1357, when it was said to be on display to "souvenir-buying crowds of pilgrims." Even then, churchmen denounced it as a fake.

Radiocarbon dating puts the age of the linen at between 1260 and 1390. But sindonologists, as shroud scholars call themselves, don't buy it. "It is simply unthinkable that in the 14th century even a genius could have conceived of a negative that could not be decoded for another six centuries," said one—even though a University of Kentucky artist has created likenesses of the shroud with techniques available to a 14th-century forger.

Ian Wilson, author of several shroud books, says the scientists' date doesn't fit with the historical facts—including reports of a similar-sounding shroud in Turkey in 525, which he thinks was the same relic. Sindonologists also believe early artists' depictions of Christ took their cue from the image on the shroud.

But this logic leaves scientists cold. Said Mike Tite of the British Museum's dating laboratory, "The date is correct."

Harvard Synthesizes Palytoxin Molecule

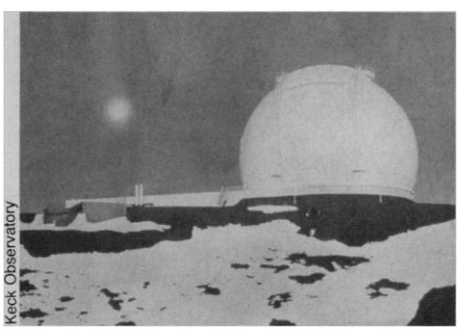


It is the Mount Everest of chemical synthesis, the largest single molecule that anyone has ever even thought about making. It is known as palytoxin, an instantly fatal poison first isolated from a Hawaiian coral that grows only in a single tidal pool on the island of Maui. It has the chemical formula $C_{129}H_{223}N_3O_{54}$. It has more than 10^{21} possible isomers. And now it has been conquered.

After 8 years of work with an army of grad students and postdocs, Harvard University chemist Yoshito Kishi has announced the first total synthesis of palytoxin. The key was first to synthesize eight separate portions of the molecule and then assemble them. The team had two motivations, says Kishi. The first and more utilitarian is to systematically modify portions of the molecule to understand how it interacts with biological systems.

But the second is pure Sir Edmund Hillary: "It's always important to demonstrate what can be done with contemporary organic synthesis," says Kishi. "This will now be a measuring standard of how far you can go."

A View That Can Take Your Breath Away



Keck Telescope *is under construction atop the Mauna Kea volcano in Hawaii.*

A new road being built for easier access to the telescopes near the summit of the Mauna Kea volcano will make it possible to go from sea level to 14,000 feet in just 90 minutes. But such rapid ascents may pose a health risk for astronomers and construction crews working at the top.

The Mauna Kea volcano has been a magnet for astronomers because of its nearly ideal viewing conditions. There are now eight telescopes either operating or under construction near the summit. But astronomers, like mountain climbers before them, have learned that there's a down side to being high up. Lower oxygen pressure can cause hypoxia and cardiac problems.

Only last year, says Hilo physician Kelvin DeGinder, an astronomer who had been tested and given a clean bill of health died of a heart attack at the summit. It's no wonder then that there is concern about an increase in health problems when the new road opens. Workers in the past stayed in a dormitory at 9000 feet to get acclimated to the altitude, but soon many may pass up this safety measure.

To assess the potential for a higher rate of health problems, DeGinder and others are studying the EKGs and blood gases of construction workers. The aim is to find early signs of who may be at risk for more serious diseases.

Federal Academic R&D Support Lags

What academic R&D funding source has grown at the fastest rate since the late 1970s? If you were to guess that it is the federal government, you'd be wrong.

Industrial and institutional funding, in fact, is where the greatest growth occurred between 1977 and 1987, according to the National Science Foundation. Nonfederal support for academic R&D, which also includes state contributions and other funding sources, grew at an average annual rate of 7% after discounting for inflation. But federal government funding increased about 4% annually during the same period.

As a result of this disparity in the growth rates, total federal support for academic R&D declined from 67% in 1977 to 61% in 1987. Total actual support for basic and applied research conducted at universities and colleges rose from $4 billion to $12.1 billion during that period.