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**COVER:** Skits by Chinese schoolchildren dramatize the early warning systems of common cancers. U.S. scientists visiting China report massive educational screening and data collection programs, but limited basic research. See story p. 124. (Photo: Chou-chik Ting, National Cancer Institute)

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# LETTERS

## Feeling no pain

Cocaine is legal under schedule 2 of The Controlled Substances Act of 1970. The mixture of cocaine and morphia referred to in "Easing senseless pain" (SN: 12/10/77, p. 392) is the Brompton Hospital Cocktail (Mist Mortis), and not Brompton's Cocktail. The Brompton Hospital, now associated with the Institute of Diseases of the Chest of the University of London, has been the leading chest hospital in that city for close to 100 years.

The cocktail has some merit, but in my experience is no better than some other preparations.

David P. Nicholson, M.D.  
Dayton, Ohio

Having completed a term paper on the "hospice," I had occasion to read much about the Brompton "cocktail" or Brompton "mix." In America it contains cocaine and does not completely alleviate pain. In England, according to all reports I've read, it contains heroin and does a complete job.

Why must our scientists do a costly study when data is readily available in England? It seems abominable to me, when the means exist to control cancer patients' pain, these people must wait for long-term studies and tedious legislation. The heroin is readily available to our addicts. Why can it not be legally available to our diseased?

Heroin does not have the same effect on cancer patients as it does on the addict. When pain is under control the level of medication does not increase as with other drugs. The patient is able to function as any healthy person will, with no impairment to the mental or emotional processes.

Dr. Cicely Saunders, founder of St. Christopher's Hospice in London, has used the Brompton mix (containing heroin) for a number of years with excellent results (SCIENCE, 7/30/76).

Are American terminal patients less deserving than Europeans?

Martha Asherman  
Port Washington, Wis.

## Random musings

I was amused to read that the battle against alcoholism has had, at best, "mixed" results. Tell me, is our tree research finally beginning to bear fruit? And is our knowledge of kangaroos improving with leaps and bounds? And will our blasted government ever allocate enough money to allow our space program to get off the ground? I wonder.

David B. Crowley  
Malvern, Pa.

## BOTEC: Comments and an answer

In the Off the Beat report (SN: 1/4/78, p. 78), it is stated that "Johannes Kepler's venerable three laws were a result of the astronomer's painstaking appraisal of Tycho Brahe's assiduous observations of planetary motions through a telescope." Tycho Brahe died almost a decade before the invention of the telescope. All of his incredibly accurate observations were made with the naked eye, using instruments which had no optical components whatsoever—only plain naked eye sighting devices.

Roland Rainge  
New Salisbury, Ind.

There was a Western shepherd who tallied his flock by counting legs and dividing by four. He was astounded to find there is an easier way.

Michael A. Guillen introduces us to the miracle of dimensional analysis by sharing with us his effortless way of figuring how many gallons are displaced by the *Queen Mary*. On board he was told that the ship "weighs" 81,237 tons. Fortunately, he not only remembered that the density of 1 cc of water is 1 gm, but also that a U.S. short ton = 907,180 gm, and that 3,785.3 cc = 1 U.S. gallon. It took only the back of one (large) envelope to convert the ship's tonnage to about 74 billion gm = 74 billion cc, and to convert those to about 18 million gals (actually, closer to 19 million).

But the density of sea water is greater than 1 cc = 1 gm, and the "tons" at which the *Queen Mary* is rated are "displacement tons," internationally standardized at 35 cu. ft. At about 7.4 gals to the cu. ft., we have about 260 gals to the displacement ton, which gives about 21,120,620 gals, on the back of a smaller envelope.

Morris Colman  
Croton-on-Hudson, N.Y.

Many of you responded to the challenge question, "How fast is a penny falling only four seconds after its release from the Empire State Building?"

Like any accelerated vehicle, the penny continuously picks up speed as it plummets under the influence of gravity. The speed depends on two factors: how long the penny has been falling (elapsed time) and the magnitude of earth's gravitational acceleration. Only one combination of these factors has units of speed (length per time), and according to dimensional analysis it provides the mathematical equation needed to solve the problem. It is "speed equals gravitational acceleration multiplied by elapsed time."

Any good encyclopedia will reveal that earth's gravity is about 10 meters per second. After falling for four seconds, therefore, the penny is falling at a speed of 40 meters per second. This translates into about 90 miles per hour!

—M.A.G.

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