

The problems of 'normal' sex

Whatever the sexual revolution was or is, it has carried in tow a host of problems and "deviancies" judged worthy of treatment by a burgeoning number of sex therapy specialists. Masters and Johnson and others have repeatedly described such problems in couples seeking treatment and prescribed various techniques to help make sex lives more "normal."

One research problem, however, is that few studies have been done to determine the constituents of sexual normality. In an effort to pursue the question of "what is normal?" researchers at the University of Pittsburgh's Western Psychiatric Institute and Clinic surveyed 100 couples "who believed their marriages were working well." The couples, married from less than one to more than 20 years, were asked to report on what sexual problems, if any, were occurring in the marriage.

The incidence of reported problems, particularly among women, was "strikingly high" among this sample of "white, Christian and well educated" couples, Ellen Frank, Carol Anderson and Debra Rubenstein report in the July 20 *NEW ENGLAND JOURNAL OF MEDICINE*. Although more than 80 percent of the couples said that their overall marital and sexual relations were happy and satisfying, 40 percent of the men reported problems with erection or ejaculation and 63 percent of the women reported corresponding problems in achieving arousal or orgasm. In addition, half the men and three-quarters of the women said they experienced other consistent "difficulties," including an inability to relax, disinterest, too little foreplay and tenderness and "partner chooses

inconvenient time."

The majority of couples surveyed said they had intercourse one to three times a week but only one percent reported daily intercourse (and two percent "never"). Couples who had sex least frequently tended to have more sex-related problems. Aside from difficulty with erection in males, no dysfunction appeared to be related to age.

The higher-than-expected occurrence of self-reported problems is particularly significant because the surveyed couples represent, if anything, a more satisfied group than most Americans, the researchers say. "This more satisfied population would be expected to report a lower frequency of sexual problems than would be predicted in the general population," they suggest.

The data also cast doubt on several previous studies that point to better sexual functioning among higher classes. The Pittsburgh group says their results correspond to similar rates of sex problems found with black, lower class women.

The results also reveal that the husband frequently underestimates the wife's problems and are "consistent with the typical American pattern...in which as long as the wife neither complains nor refuses to have intercourse, the husband assumes that all is well," say the investigators. Despite the problems, the couples "still feel very positive about their sexual relations and their marriages," they report. However, it appears that when problems do occur, those of the wife were "least well tolerated" and produced a "ripple effect on all sexual relations" involving the couple. □

Liquid protein: A deadly diet

It sounded logical in 1967 when several French physicians advocated using liquid protein as a dietary supplement for obese patients trying to lose weight by fasting. It no longer sounds very logical — or safe.

Liquid protein consists, essentially, of protein processed from the gelatin in cowhide or from some other source of connective tissue. It supposedly provides patients with just enough low-calorie nutrition to help them survive the rigors of near-starvation diets and has been reported to bring about remarkable weight losses with relatively minor side effects. In 1976 the liquid protein diet was popularized in a book called *The Last Chance Diet*. During 1977 at least 100,000 Americans used liquid protein.

Toward the latter part of 1977, however, the diet was linked with a number of deaths. And the indictment has continued to grow. At last count, the diet has been associated with 58 deaths, according to the July 7 *MORBIDITY AND MORTALITY*

WEEKLY REPORTS, published by the U.S. Center for Disease Control in Atlanta. All of the deaths occurred during the latter half of 1977 and the early part of this year.

How might the diet have caused all these deaths? Apparently by triggering heart arrhythmias — excessively rapid beating of the ventricles of the heart accompanied by twitching (fibrillation) of fibers in the ventricles — resulting in heart failure, according to Bramah N. Singh and his colleagues at the University of California at Los Angeles School of Medicine. Their report is in the July 14 *JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION*. The precise means by which the diet creates these heart aberrations is not known, however. As Theodore B. Van Itallie, a physician at St. Luke's Hospital Center in New York City, points out in an accompanying editorial, "It is not clear whether the deleterious effects of liquid protein diets occur because of some insidious dietary deficiency, e.g., of protein, potas-

sium or a trace element, because of the presence of a toxic agent of some sort in the preparation, or because of some totally unexpected cause."

The tragedy, he continues, is "that the liquid protein materials were never tested in appropriate laboratory animals to determine their safety for prolonged use for weight reduction. Moreover, there is a serious dearth of detailed clinical studies on the metabolic effect of the liquid protein diet." The unnecessary deaths, he concludes, "are a somber reminder of... the consequences that can occur when therapy outstrips its research base."

The liquid protein diet, in fact, appears to be potentially fatal even when young, healthy persons take it under a physician's supervision. All four patients described in the report by Singh and co-workers were young and healthy, except for their obesity. All received some form of medical supervision during the five or six months they took the diet. And all received emergency medical treatment for their heart arrhythmias, yet only one survived.

Although the Food and Drug Administration has not yet banned the diet, it is investigating the deaths associated with it. The FDA has also issued warnings about the safety of the diet, and there are indications that dieters are heeding these warnings. For instance, the U.S. Public Health Service recently reported that about twice as many dieters are using fasting as a total means of losing weight during 1978 as during 1977, suggesting that far fewer are relying on liquid protein diets this year than last to help them lose weight. □

Viking: A death and an anniversary

The Viking mission to Mars has accumulated an impressive list of accomplishments, beginning with the arrival of Viking 1 at its circum-Martian orbit on June 19, 1976, and the successful touchdown on the surface by its landing craft about a month later on July 20. Viking 2 arrived on August 7 of the same year, sending its own lander down on September 3. Two recent events have now been added to the Viking diary — one an occasion for happiness, the other for sorrow.

Last Thursday, a group of Viking participants and National Aeronautics and Space Administration officials met at the NASA Langley Research Center in Hampton, Va., to celebrate the second anniversary of the Viking 1 landing. The lander itself is still at work, having passed its originally planned operating lifetime, and the birthday of the billion-dollar mission's major event was marked by the issuance at Langley of a 15-cent commemorative stamp.

Only four days later, however, a less cheery event took place on Mars. The Viking 2 orbiter succumbed at last to a series



of leaks that had plagued it for months, giving off the final few millipounds of gas that helped flight controllers maintain its orientation in space. With no way to keep its antennas pointed at the earth, the craft was effectively useless, and an on-board command was automatically triggered to silence its transmitter forever. (Its final weeks had been conducted in true Viking spirit: Knowing that the control gas was almost gone, Viking officials at Jet Propulsion Laboratory in Pasadena had hoped to acquire either some additional mid-latitude photo-mapping or a few more polar passes to provide water-vapor data. The spacecraft provided both.)

The other orbiter and both landers, meanwhile, are continuing to function. Orbiter 1 will now have to relay data to earth from both landers, probably "servicing" each landing craft about once a month. Present plans call for operating the orbiter through late February 1979, which will allow radio-propagation studies to run through the next solar conjunction.

Lander 1 may continue to operate for as long as two years, says mission director Kermit Watkins, since it has the capability of sending at least low-rate data directly to earth without the need for the orbiter relay. (Even after two years, the craft's location on the Martian surface continues to be refined. Merton Davies of the Rand Corp. says that matching of terrain features in pictures from the lander with high-resolution views from orbit [SN: 9/24/77, p. 199] now show the craft to be at longitude 47.968°W—about 8.2 kilometers west of its previously calculated site.)

Lander 2 will probably be the first of the remaining craft to be shut down, assuming that malfunctions do not change the sequence. It no longer has the capability of transmitting directly to earth, so it would be rendered effectively mute when the surviving orbiter is turned off, but the end will in fact come sooner—in early December—when the automatic data-gathering program now stored in its computer runs out. Meanwhile, the data continue to yield new results: It was lander 2, halfway to the Martian north pole, that photographed frost on the planet's surface (SN: 10/8/77, p. 228), and photos taken since the frost's disappearance look distinctly different from their "pre-frost" counterparts. Perhaps, suggests Ken Jones of JPL, the frost brought in dust particles that were then left behind, adding to Mars's many already known ways of modifying its surface complexion. □

Blood types deciphered

For fifty years, human blood has been classified as type M, type N and type MN, although nobody knew what the actual differences were. A rabbit's immune system makes the distinction—based on a human blood sample's reaction to rabbit antibody known to combine with M or N blood. Now several research groups have discovered the exact difference between M- and N-type blood. It is a variation in just two amino acids in a major membrane component of red blood cells. Furthermore, the rabbit antibody appears to react with both the sugar and amino acid subunits of those molecules, Elwira Lisowska of the Polish Academy of Sciences told a conference on Complex Carbohydrates in Biological Recognition at the National Institutes of Health.

The MN blood groups were discovered seven years after discovery of the better-known ABH (or ABO) blood types. Both groupings provided early examples of genetic codominance: A person with one M and one N gene, or one A and one B gene, expresses both genes. Different sugars on the key molecule of the ABH system are

responsible for the antibody reaction. But the critical distinction between M- and N-type blood turned out to be a subtle difference in amino acid composition.

A few years ago amino acid sequences of the protein portion of MN-specifying molecules (called glyophorin A) revealed a mixture of two amino acids at each of two sites. Recent analyses showed amino acids serine and glycine at positions 1 and 5 in the M glyophorin A and leucine and glutamic acid at those positions in the N molecule. The blood of MN donors contained a mixture of those two types of glyophorin A, just as genetic codominance would predict. Lisowska, H. Furthmayr and V. T. Marchesi of Yale University, Olga Blumenfeld of Albert Einstein School of Medicine and W. Dahr and G. Uhlenbruck of the University of Cologne have all reported similar results.

A major surprise in this research is that although the amino acids seem to specify which antibody will react, the antibody reaction also requires carbohydrate close to the critical peptide sequence. Once researchers remove the sugar groups chemically, the antibody can no longer recognize the molecule. In other cases biologists have found either the sugars or the polypeptide, but not both, essential to an antibody's recognition. □

Stopping infection before it starts

Experiments show that flushing the bladders of mice with the sugar methyl alpha-D-mannoside prevents urinary tract infections by *Escherichia coli*, Nathan Sharon of the Weizmann Institute in Israel told the carbohydrate conference. This use of sugar may become an effective prophylactic procedure for persons prone to infection, such as catheterized patients, newborn infants in developing countries and burn victims.

The novel approach to blocking infections has arisen from investigations of bacterial attachment to cell surfaces. Adherence is a prerequisite of bacterial colonization and infection. The idea that surface sugars are the binding sites for bacteria has been hidden in the scientific literature since the 1950s, Sharon says. That role for sugars was rediscovered in 1977, following evidence that in many cases cell surface sugars play a central role in biological recognition.

Sharon and colleagues David Mirelman and Itzhak Ofek have identified both parts of the attachment mechanism. The cell surface site is a sugar, mannose or a related structure, present on nearly all cell membranes. Special proteins capable of grabbing onto mannose have been detected on *E. coli* and some other infectious bacteria. The investigators have isolated the grabbing protein, which appears to sit on the bacteria's filamentous appendages (pili).

Sharon and colleagues find they can

interfere with the binding of a bacterium to a cell by flooding the cell surface with a solution containing mannose or certain mannose derivatives. Furthermore, mannose-containing solutions can remove bacteria already attached to cells. In those experiments, the bacterial protein attaches to the sugars in solution, instead of to the sugars on the cell surface.

Research in other laboratories indicates that different sugars may play a role in the binding of other pathogenic agents. Perhaps a battery of simple, nontoxic chemicals will soon prevent bacterial adherence to cells and ensure that the pathogens are sneezed, coughed or flushed out of the body. □

New education agency

A separate, Cabinet-level Department of Education moved one step closer to reality last week when the Senate Governmental Affairs Committee voted unanimously to create it. The Senate bill would engender the new agency with an initial budget of \$18 billion and a staff of 24,000. The Department of Health, Education and Welfare would be stripped of most, but not all, of its education programs and responsibilities; several other agencies also stand to lose oversight and control of substantial education-related programs in the reorganizational shuffle. The House has begun hearings on a reciprocal bill. □