could make an X-ray microscope capable of resolving structures as small as 200 angstroms in living biological specimens. Electron microscopes have a resolution of a few angstroms, but the specimens have to be put through special preparation which may alter their structures. Light microscopes will take living specimens, but their resolution is limited to about 2,000 angstroms.

Further progress, the announcement says, will depend on improvements in the shaping of the mirror blanks on which these layers are deposited. These have been manufactured to visible light tolerances. X-rays will require a factor of 10 improvement. □

Toxic shock declines, as does tampon use

The saga of toxic shock syndrome has taken an unexpected turn. Just when publicity about the rare, sometimes fatal, disease was expected to boost the number of reported cases, the incidence of the syndrome appears to have dropped dramatically. In August 1980, the peak month, 119 cases were reported to the Centers for Disease Control but, after a steady decline, only 37 cases were tallied in December.

The most likely explanation for the sudden decrease in toxic shock incidence is that women have changed their tampon-wearing habits, says the CDC's MORBIDITY AND MORTALITY WEEKLY REPORT. The syndrome was reported last summer to be associated with tampon use (SN: 7/5/80, p. 6). Telephone interviews by tampon manufacturers indicate that from July 1980 to December tampon use dropped from 70 percent to 55 percent. In addition, Rely brand tampons, which were associated with an increased risk of toxic shock syndrome (SN: 9/27/80, p. 198), were removed from the market in September. The tampon manufacturers also report no decrease since September in the proportion of tampon users who choose highly absorbent tampons, which have been suspected of increasing risk of the syndrome.

Several possible explanations for the drop in toxic shock incidence have been discounted by the CDC. Seasonal variation is an unlikely cause because in 1979 the number of reported cases climbed steadily from fewer than 10 per month in August and September to 28 in December. Another explanation, this one stressed by Procter and Gamble (the manufacturers of Rely) in a press release, is that a change in the reporting system in September makes comparison with earlier counts misleading. Since September, physicians have reported cases to the state health departments instead of directly to CDC. The center, however, finds a decline even when it considers only cases reported through state health departments. □

Platonic chemistry: Now a dodecahedrane

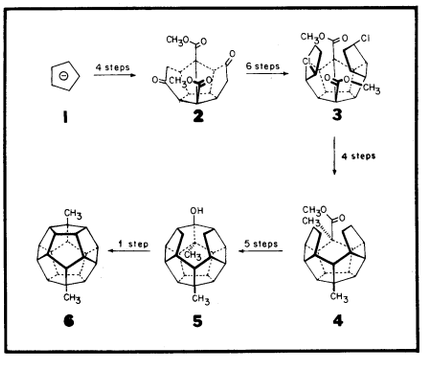
What do you get when you mix sophisticated organic chemistry know-how with the abstract thinking of Plato's time? Chemists trying to form polyhedrons out of carbons and hydrogens.

Platonic philosophers recognized five regular polyhedra: the cube, tetrahedron, octahedron, icosahedron and dodecahedron. When the heritage of these Platonic solids entered the realm of organic chemistry about two decades ago, researchers first constructed hydrocarbon cubes (cubanes) and tetrahedrons (tetrahedranes) with carbons at the corners of each polyhedral face. A hydrocarbon icosahedron—in which five lines intersect to form each corner—was ruled out because carbons can bind to only four other atoms. The octahedron also did not appear to be a feasible synthetic target because each corner carbon should have to bind to four other carbons at impossible, strained angles. The dodecahedron, therefore, was the only realistic, synthetic hydrocarbon-cage target remaining among the five Platonic solids.

Now, Leo A. Paquette and colleagues of Ohio State University at Columbus have constructed the first 20-sided hydrocarbon structure, or dodecahedrane, completing the possible set of wholly hydrocarbon Platonic solids. The chemists detail the synthesis of their Platonic solid — 1,16-dimethyldodecahedrane (labeled "6" in the diagram)—in the Feb. 6 SCIENCE.

The synthesis of dimethyldodecahedrane was quite a chemical challenge, says research colleague Gary G. Christoph. "The real problem is in trying to get all 20 [corner] carbon atoms in the right configuration so it is possible to finally close the structure," he explains. "The structure of the molecule looks like the lines on a soccer ball," Christoph says. "We're fighting nature to form these lines; if it were easy, nature would already have done it." But the organic soccer ball does not exist naturally; instead, it took 19 man-years of laboratory effort to produce the "unusual beast," says Christoph.

Exploring this beast's potential utility is one of the next steps of the dodecahedral research. "It's hard to say what it's going to be good for," Paquette says, "because we have never before had it to study." Still, the researchers have some ideas. First, the ball bearing-like quality of the dodecahedral crystals may impart a lubricant property. In addition, modifications of the structure to enlarge the center space may make it possible to insert atoms in the vacant enclosure. Finally, the dimethyldodecahedrane's high degree of symmetry may be useful. Researchers have theorized that the more symmetrical a hydrocarbon is, the easier it can penetrate the body's cell walls. If this theory is proved true, then highly symmetrical hydrocarbons may make more efficient the delivery, for instance, of antiviral agents.



Meanwhile, Paquette and colleagues are striving for an even more symmetrical organic dodecahedron: The two extra methyl, or CH_3, groups on their present structure make it two degrees less symmetrical than its parent—one without the extra groups. Says Christoph, "We hope to have the parent compound within the next several months or so." □

Vitamins vs. mental retardation

Vitamin and mineral supplements can significantly increase the intelligence of retarded children, especially those with Down's syndrome, researchers report in the January PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES. The work is reported by Ruth Harrell, professor emerita of psychology at Old Dominion University in Norfolk, Va., Dwight Newell of Old Dominion University, Ruth H. Capp of the University of Arizona College of Medicine, Donald R. Davis of the University of Texas, and Julius Peerless and Leonard R. Ravitz, private physicians in Norfolk, Va.

The researchers studied 22 severely retarded youngsters, eight of them with Down's syndrome, in order to test a hypothesis put forth 30 years ago by Roger J. Williams of the University of Texas — that genetically determined diseases such as mental retardation can be improved with better nutrition. The I.Q. levels of all the youngsters were tested at the start of the study. Half of them then received relatively large amounts of 11 vitamins and moderate amounts of eight minerals three times a day for four months. The other half got placebos three times daily during the same period. At the end of the four months, all of the subjects had their I.Q.s retested. Those who had received vitamins and minerals showed a statistically significant mean I.Q. score increase of five points compared with an increase of 1.1 points for the placebo subjects. When the placebo subjects got the vitamin-mineral supplements for a four-month period,