3M has announced the formation of a new Space Research and Applications Laboratory, with a research staff of 15 scientists. The company will also be assisting NASA in developing a chemistry laboratory for the space station.

Protein crystals for medical research

In February, a number of large universities and drug companies signed agreements with NASA to fly hundreds of experiments that will grow protein crystals in space, to provide biology researchers with crystals that are large enough to be used to study the multi-dimensional atomic structure of protein molecules.

During the Spacelab flight in November 1983, West German scientist Walter Littke grew one type of protein crystal that was 1,000 times larger than the control crystal on the ground, and 30 times larger than his ground crystal grown using the space-designed process.

Using x-ray crystallography, pharmaceutical companies will be able to determine the precise geometric structure of the large space-grown proteins. With that knowledge, they can genetically engineer, for example, proteins with the same structure but a different chemical composition, to block disease-causing agents.

They could also use genetic engineering to produce a gene to duplicate the fine structure of a needed protein, which could be used to supplement the natural production of the protein in someone who has a specific deficiency.

Research in this protein crystal growth area is so promising that the experimental program will begin on the next Space Shuttle mission. The next flight will include the first 36 crystal-growth experiments, which will be supervised by Charles Walker of McDonnell Douglas, who will be making his second trip into space with the electrophoresis equipment.

In August, a Space Shuttle mission will carry 100-200 additional protein-crystal experiments into space. The three-year agreement signed in February will be broadened to include more experiments and institutions.

Also in February, the Grumman Corporation of New York signed a memorandum of understanding with NASA for a research program in space-materials-processing. Grumman will focus on the production of gallium arsenide and other semiconductor crystals, and various metal alloys for magnets and electrical motors.

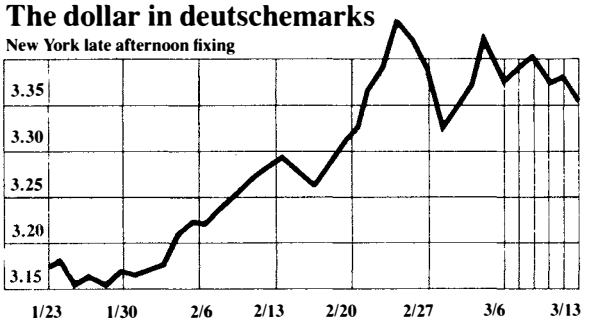
The process will involve directional solidification, using precisely controlled temperatures to melt and then solidify a material. During the process, the material's crystalline structure or molecular geometry is aligned so as to virtually eliminate any imperfections in the compound. This could lead to higher-speed electronic devices that consume less power, and are even more miniaturized than today's microcircuit chips.

Materials processing is the area of private industry investment in space which promises to yield the greatest returns over the next two decades, because it will produce new materials which can cure disease and will create new industries on Earth.

Currency Rates

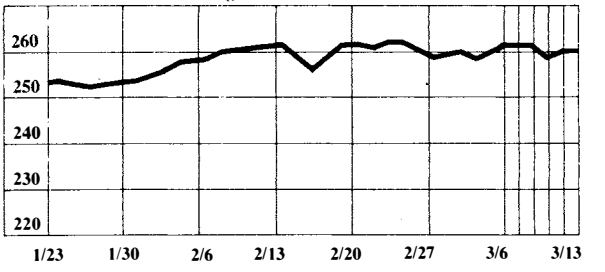
The dollar in deutschemarks

New York late afternoon fixing



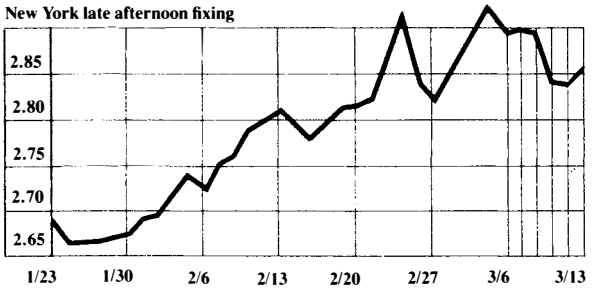
The dollar in yen

New York late afternoon fixing



The dollar in Swiss francs

New York late afternoon fixing



The British pound in dollars

New York late afternoon fixing