The board also responded to criticism that NSF has been too high-handed in its curriculum development and implementation, by passing resolutions strongly reaffirming the need for a vigorous NSF role in both areas, while stressing the need to "avoid any appearance of indoctrination or coercion" of pupils.

The board said that the foundation should have a continuing role in developing "intellectually challenging" science courses for elementary and secondary schools, courses that reflect changing world society and conditions in America. The courses should encourage future scientists and increase the understanding of science by all pupils, the NSB resolved.

Upon implementing such courses, NSF should provide information about available alternatives and undertake a careful review of all materials to see that the subject matter "fits within reasonable limits or norms with respect to educational value, and that the scientific content is accurate," the NSB ruled. Such reviews also should include comments from concerned professionals and the public.

Finally, the board recognized that "education is, by its nature, controversial," and said that NSF should therefore not attempt to avoid controversy in the development or implementation of new materials. However, such efforts must be based on a commitment to "pluralism" in education, the board resolved, and NSF should conduct a careful analysis of future educational needs, ensure competitive selection of project developers and encourage development of alternative courses. □

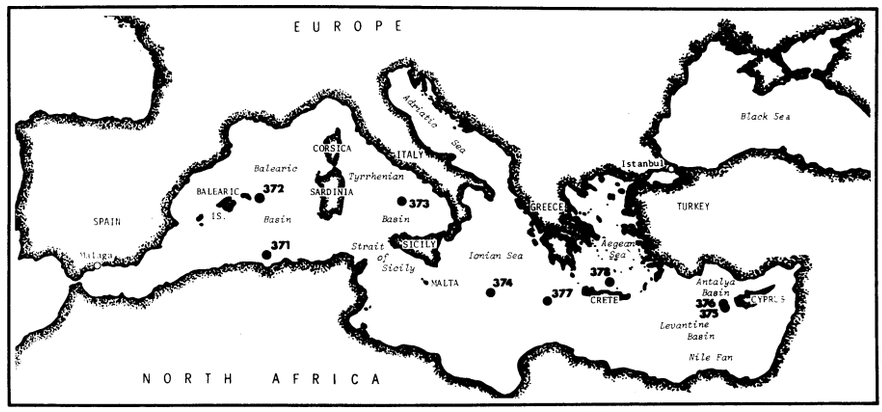
Inflation squeezes research in U.S.

Total research and development purchasing power in the United States will decrease roughly three percent in 1975, once inflation has been taken into account. The National Science Foundation issued this gloomy conclusion in the latest of its periodic "National Patterns of R&D Resources" reports.

Though R&D spending will total $34.3 billion in 1975, seven percent above last year's level and representing the same 2.3 percent of the Gross National Product, the actual spending power as measured in constant dollars will decline significantly. The largest drop occurs in basic research, which accounts for 12 percent of the nation's R&D effort. Though spending for basic research will rise two percent, the actual purchasing power of that effort will decline nearly eight percent. This decline will have its strongest effect on the colleges and universities that conduct most of the country's basic research.

Federal funds for R&D will total $18.2 billion in 1975, while industry's contribution will be nearly $15 billion. Both figures rose by seven percent over 1974 expenditures. □

Mediterranean: Probing its origins



Numbered dots show where Challenger drilled into Glomar Mediterranean basins.

Despite its irregular coastline, the Mediterranean, seen from above, appears to be a relatively straightforward body of water, broken only by the boot of Italy and several major islands. Beneath its lugubrious waves, however, lies a much more complex reality. Divided into eastern and western halves by a submarine ridge joining Sicily and Tunisia, it is further compartmented into five major basins.

Five years ago, the deep-drilling ship Glomar Challenger sampled sediments from the Mediterranean floor during the 13th leg of its circumplanetary rounds. These core samples raised the possibility that as recently as six million years ago the balmy sea had been a vast, arid wasteland, pocked only with some "relatively shallow, obviously nonmarine" bodies of water.

Controversy arose, however, about the depth of these bodies before the Mediterranean began to develop into a full-fledged ocean. If the water had been deep before that time, Challenger scientists reasoned, then its disappearence must have resulted from a catastrophic episode indeed—a "crisis of salinity" unknown among any of the world's other major bodies of water.

To investigate the issue, the Challenger, now equipped with newer, more sophisticated drilling techniques and equipment, this spring probed deep into the present-day basins, scouting the sedimentary rocks below the evaporites from the crisis period. The results, according to the Scripps Institution of Oceanography in California, which manages the Deep Sea Drilling Project, have now shown that water-filled basins at least 500 to 1,000 meters deep existed prior to the formation of the marine salt deposits. The crisis of salinity by this measure appears to have been real.

The Challenger was unable to probe these primordial basins below the 1,000-meter mark, however, and the present basins are as deep as 3,000 meters. Thus it is possible to argue that the basins may have been deepened tectonically since the arid phase ended; in other words, that the really deep basins and the implied crisis never existed.

But there is a counter-counter-argument as well, points out Robert B. Kidd of the Institute of Oceanographic Sciences in Wormley, England. Recent studies of Mediterranean benthic foraminifera—tiny, fossilized deep-water creatures whose types can be correlated with the depths at which they lived—have revealed types from the basin regions that are characteristic of water depths at least as great as 3,000 meters. Even without additional, deeper corings by the Challenger, says Kidd, it should be possible for such studies to settle the matter over the next few months. □

An unevenness in the cosmic rays

For sixty years physicists have observed the cosmic rays. Mostly protons, but with some light nuclei and a very few heavy nuclei, they come to earth in equal amounts from all directions. This isotropy poses a difficulty for those who attempt to theorize on the origin of the cosmic rays. If the sources are within our galaxy, the shape of the galaxy should show up in the observations. But if the origin is extragalactic, all of the intergalactic space has to be populated with this flux, and that requires stupendous sources indeed.

Now there is evidence for a small anisotropy. It was found by a Hungarian-Bulgarian collaboration (T. Gombosi et al.) and is reported in the June 26 NATURE. Their equipment is on the Musala peak of Bulgaria's Rila Mountains.

The anisotropy is a maximum flux in the direction away from the galactic center. Diffusion of cosmic rays by magnetic fields or streaming of cosmic rays away from the galactic center and perpendicular to the galactic plane are possible explanations. □