PETRA modifications. An updated version of the PETRA proposal describes as the most important change from the original design a zero dispersion of the beams in the straight sections of the ring. The effect will be to reduce the importance of synchrotron–betatron-coupling at high energies and to guarantee that the electron and positron beams will meet properly. Another alteration to the original design will place the beams at midheight in the tunnel, which would permit experiments dependent upon longitudinal polarization of the beams at interaction points. At present there are no firm indications that such experiments will take place, but the possibility exists.

So-called "wiggler" magnets may be used to increase radiation damping and to help control beam emittance in PETRA to maintain a constant equivalent energy. The type of wigglers suggested for the storage ring could replace standard bending magnets where used, and either two or four such wiggler magnets may be installed.

International cooperation. Funds for major new scientific projects are tight everywhere, which may explain some of the builders' willingness for other nations to confer upon and design—and help pay for—experiments at the new facility.

To this end a meeting sponsored by the European Committee for Future Accelerators and organized by DESY and the Italian Istituto Nazionale di Fisica Nucleare took place at Frascati, Italy, in the first week of March. Some 200 physicists from the US, Israel and Japan, as well as Europe, participated in the discussion of possible experiments and detection systems. Letters of intent on these subjects were to be sent to the research committee for PETRA by the end of April, proposals by 31 July. A workshop on PETRA will meet at DESY during 6–11 September, and experimental setups for the first two interaction regions are expected to be decided upon in October.

Detectors. According to information provided by Voss, the experimental setups considered so far by the international cast of potential users are almost all nearly full solid-angle magnetic detectors, either normally conducting or superconducting solenoids. The proposed detectors vary from 1 to 5.0 meters in diameter and would produce coaxial magnetic fields of up to 2.0 Tesla. Assemblies of electron, photon and muon detectors would be arranged about the solenoids; the interiors would be filled by drift chambers for the reconstruction of particle tracks. Because there remains little time for the preparation of apparatus for the first experiments, some of the detectors used in connection with DORIS may find their way into PETRA for the early research efforts.

Experimental halls. The PETRA ring will include eight straight sections, four of them 64.8 meters long, the others 108 meters. The four short sections and two of the long will eventually provide interaction regions available to experimental users; at first only four such regions will be available. In contrast, PEP will have six straight sections, five of which would house experimental halls. —FCB

Heard any bad knees lately?

Knee-joint problems of various kinds seem to affect almost everyone sooner or later, highly priced football players and ordinary mortals alike. A group at the University of Akron have been listening to the clicking and scraping noises of defective knees, and they reported to the 91st Meeting of the Acoustical Society of America, in Washington last April, on what they had heard. The photograph shows Larry Zavodney, a graduate student in mechanical engineering, with a cow's knee joint that he and Mamerto L. Chu are using for *in vitro* studies of these sounds.

A cartilage surface of this joint has been artificially roughened to simulate a pathological condition—say, arthritis—and the noise produced on flexing the joint is picked up by condenser microphone. After amplification, conversion to digital form, and computer-aided statistical analysis, the signal shows unique acoustical characteristics for various types of knee-joint diseases. Zavodney and Chu claim that this acoustical "signature" may become useful as a rough diagnosis of the various diseases that can affect joints.

For a parallel study of the progress of joint diseases in living specimens, Zavodney and Chu, joined by Richard Mostardi and Ivan Gradisar, are doing a similar experiment with rabbits. Here the Akron team create an artificial "disease" by surgery on a live specimen and follow its progress by listening to the sounds generated, at different times, by the flexing joint just as in the *in vitro* experiments on cow's knees. Finally, surgical examination enables measurement of the cartilage roughness at an advanced stage of the disease to be measured. Preliminary results reported to the ASA meeting suggest that there is a close connection between the degree of roughness of the diseased cartilage and the acoustical signature detected. The goal is a technique for diagnosis of conditions such as arthritis at earlier stages than is currently possible. —JTS

Comparison of PETRA with PEP

	PETRA	PEP
Maximum beam energy	19 GeV	18 GeV
Maximum beam luminosity	10^{32} cm^{-2} sec^{-1}	10^{32} cm^{-2} sec^{-1}
Maximum current per beam	80 mA	90 mA
Experimental halls	6	5
Colliding-beam start-up date	July 1979	April 1980

in brief

A geothermal testing facility, now under construction at Lawrence Berkeley Laboratory, is scheduled for completion in September in California's Imperial Valley at East Mesa. The \$1-million project, funded by ERDA, will provide the medium-temperature brines needed for experiments.

The 400-GeV Super Proton Synchrotron at CERN, now in the last phase of construction, began ejection tests in mid-March with 10-GeV protons from the 28-GeV Proton Synchrotron. In May the proton beam was injected into the SPS and bent along a circular path within the confines of the vacuum chamber.

The 3.6-meter telescope of the European Southern Observatory was scheduled for shipping to Chile by sea in mid-February, and assembly on the La Silla site was to begin in March. The first astronomical observations are expected to begin this fall. □