quently the station should be expanded to include facilities for testing other detection methods proposed by this Panel or methods which may be developed through future research programs. A high priority should be given to testing arrays of up to 100 seismometers and testing a system of unmanned auxiliary stations. . . .

Finally, research should be stimulated to develop new methods of detection. The Panel suggests two specific approaches. One method is based on a line of theoretical reasoning, supported by some experimental data, which suggests that seismographs installed and operated at depths of several thousand feet below the earth's surface may have the capability to detect smaller P-waves than those detectable at the surface. This approach is suggested by considerations which show that the surface noises, which now limit detection, may die off more rapidly with depth than do the signals of interest from explosions and earthquakes. A second approach, based on a somewhat similar line of reasoning, suggests that there may be extremely low noise levels at the bottoms of the oceans, at least at some frequencies. The development of a reliable operational detection system, based on either of these approaches, involves the solution of some major engineering problems; the expected signal-to-noise improvements, however, are potentially so great that the experiments necessary to test the basic theories should be conducted as soon as possible. Work is in progress at the present time on the first method, and some preliminary equipment design work has been completed on the ocean-bottom seismometer. . . .

Data Processing Must Be Centralized

The Panel recommends the establishment of a central computer facility, available to all seismologists, where the computations necessary to the research outlined in this report can be made. Allowance should be made for supplementary computing facilities which will also be required by individual research projects. A library of digitalized seismograms, to include earthquakes, explosions and noise samples should be maintained at the computing center. . . .

Since there are many thousands of events recorded per year at some seismic stations, to perform this analysis adequately by manual methods will require a large skilled staff. The use of computers should be investigated as a means of performing at an adequate rate the tasks of filtering and decision making that are required of the Geneva system. . . .

New Panel Recommended

It is recommended that an advisory panel be established, perhaps through the National Academy of Sciences, to perform these functions. The Panel has demonstrated how effectively a group drawn from research seismologists, physicists, mathematicians and enginers can function in advancing seismological research and it is recommended that the advisory panel be similarly constituted.

It is strongly recommended that this program be viewed as a "package," one centrally funded and directed, in order to derive the fullest benefits. . . .

The Panel believes that the research program can best be carried out by various existing private, university and government laboratories, coordinated by a panel of scientists, possibly under the aegis of the National Academy of Sciences. In contrast to this arrangement for research, the Panel recommends that the "system development" responsibility be assigned to a *single* well organized central laboratory. Such a laboratory should have competence not only in seismology, but also in development, engineering, and large system operation. The laboratory would [probably] sub-contract with private industry for much, or perhaps all, of the specific hardware develment and procurement. However, it is essential that the laboratory have full responsibility for the planning of the system (including its orderly metamorphosis with time), for field trials, for implementation, and possibly for the American portion of its operation. . . .

The Panel . . . recognizes that this program will result in dramatic advances in our knowledge of the earth's interior, of the mechanism of earthquakes, and of elastic wave propagation. Now that seismographic stations are being planned for placement on other planets, seismological research will bear on new questions relating to the origin of the solar system. . . .

It is the opinion of the Panel that [such] research studies will certainly improve detection capabilities of underground nuclear detonations. However, the improvements are not likely to be evaluated adequately . . . in a detection system before one year of research activity at best. Most of them will undoubtedly require more time, perhaps three years. Thus, it is important to conceive of the detection system as one which will gradually evolve with time and reach a high level of detection capability only after several years.

(In a table accompanying the report, the panel gave an estimate of approximately $53 million as the cost of its basic 2-year research program in seismology. This figure includes the costs of individual research projects, system development, and nuclear and high-explosive detonations but excludes the cost of implementing a detection system. The panel suggested that the program should continue after the conclusions of the basic program at least at the level of expenditure of the first two years.)

Deadline for Euratom Proposals Extended

The U.S. Atomic Energy Commission and the Commission of the European Atomic Energy Community have extended from 1 September to 20 October 1959 the deadline for definitive proposals for nuclear power projects under the U.S.-Euratom Joint Program. The date was extended at the request of President Etienne Hirsch of the Euratom Commission. The extension will give interested utilities within the Community additional time to evaluate fully the bids of prospective reactor manufacturers, to make necessary arrangements with their respective governments, and to prepare their final proposals for submission to the Joint Reactor Board. Letters of intention to participate in the program have been received from five such utilities, but several of these groups requested a short extension of the deadline in order to complete the preparation of their proposals.

Controversy in New Jersey

A small, private research laboratory, set up in farm buildings in the residential section of Morristown, New Jersey, has embroiled its owner, George Mangun, in a controversy that may have to be resolved in the higher courts of the state. Two questions are at issue: Does Mangun's small medical research laboratory violate the zoning laws of Mendham Township? And, if so, are the laws, which allow physicians, surgeons, and engineers to maintain offices in the area, being unduly applied against Mangun's activities? The Township Committee has given an answer, an affirmative one, to the first question. It has given Mangun