from Geneva suggested that our own representatives had interpreted this announcement as implying more than the Russian agreement in principle had actually conceded. Our representatives consequently expected a sharp Russian reaction. But the Russians did not make a fuss over the issue, and this mild reaction, when the Russians had an excellent opportunity to disrupt the meetings, came a week after the plane was down and several days after the story had broken into the open. From this and similar evidence, many observers incline to the belief that the Russians never intended any major alteration in their policies, but at Paris were reacting to what they felt was a sharp challenge to their national prestige contained in our public statements regarding the U-2. Indeed, James Reston reported that even as Khrushchev was going through the process of disrupting the conference his aides were assuring their Western opposite numbers that the Geneva conferences would continue.

American Reaction

On the American side we have already announced that the U-2 flights have been stopped and will not be resumed, and Eisenhower's somewhat enigmatic remark in Portugal that "perhaps here and there leaders make mistakes" was widely interpreted as an indication that despite the official American position, which puts all the blame on the Russians, the American leadership privately feels that we, too, were at fault.

Nevertheless, no matter how conciliatory the reaction of the Russians and ourselves, it is still felt that there is a serious question as to how much the Geneva negotiators will be able to accomplish until some months have passed and the tensions of the past weeks are relaxed. Even before the summit the President was under pressure to resume testing. Serious doubts had been raised regarding the degree of risk involved in the proposed treaty. These pressures and doubts will certainly be increased now. Joseph Alsop has reported that before leaving Paris Defense Secretary Thomas Gates and Chairman John McCone of the Atomic Energy Commission both urged the President to break off the Geneva talks. Edward Teller has made a strong statement asking for an immediate resumption of weapon testing in view of the collapse of the summit talks.

These men are far from alone in taking the position they do, and although the arguments they put forth have so far won only minority support in the political community, there are nevertheless serious arguments which cannot be lightly brushed aside. No one knows how much influence these views, strengthened by the summit breakup, will have. So far there has been no indication that will lead to an American withdrawal from the Geneva talks, but certainly no one expects a test ban treaty for a good many months.

There remains the *de facto* ban that has been in effect for 2 years. (Except for the two French tests, no one, so far as is known, has exploded a nuclear bomb since 1958.) But, it is pointed out, the real significance of the proposed treaty is not that it will stop ourselves and the Russians from further weapon development (We each already have the power to kill everyone on earth several times over.) but that it will be a step toward general disarmament and, more immediately, toward preventing the spread of atomic weapons to the at least half a dozen other powers, including Red China, which will be in a position to test nuclear weapons within a very few years.

Atoms for Peace Awards Presented

Four scientists who have made fundamental contributions to the development of nuclear reactors were presented with the $75,000 Atoms for Peace Awards for 1959 and 1960 on 18 May in a ceremony at the National Academy of Sciences. Leo Szilard, professor of biophysics at the University of Chicago, and Eugene P. Wigner, professor of theoretical physics at Princeton University, share the 1959 award, and Walter H. Zinn, vice president of the Combustion Engineering Corporation, and Alvin M. Weinberg, director of the Oak Ridge National Laboratory, share this year's award.

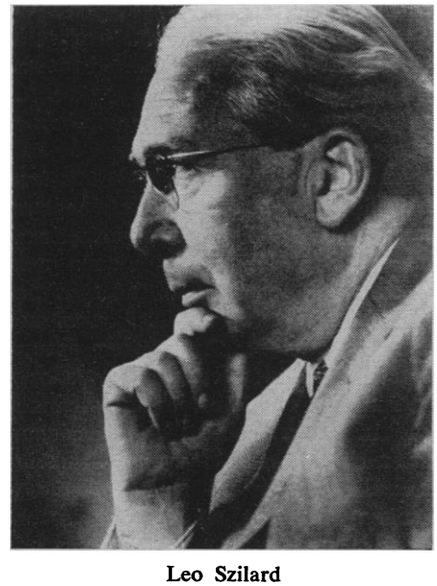
All four men are pioneer nuclear scientists who worked together at the Metallurgical Laboratory of the University of Chicago in 1942, when the first self-sustaining nuclear reaction was achieved at Stagg Field on 2 December. Szilard and Wigner composed the famous letter to Franklin D. Roosevelt from Albert Einstein that resulted in large-scale governmental support of nuclear investigations [see *Science* **131**, 1086 (15 Apr. 1960)].

The Atoms for Peace Award was established by the Ford Motor Company in 1955 as a memorial to Henry and Edsel Ford.

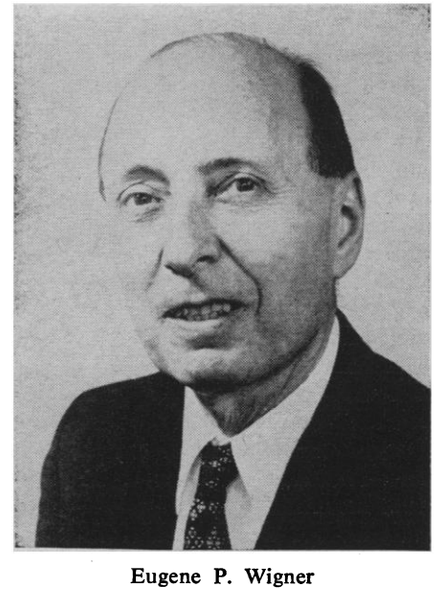
Winners Comment on Test Suspension

At a news conference after the presentation, the award winners were asked what they thought about current proposals for nuclear test suspension. Both Szilard and Wigner expressed a concern that the three-nation monitoring system under consideration at Geneva would only lead to friction and confusion.

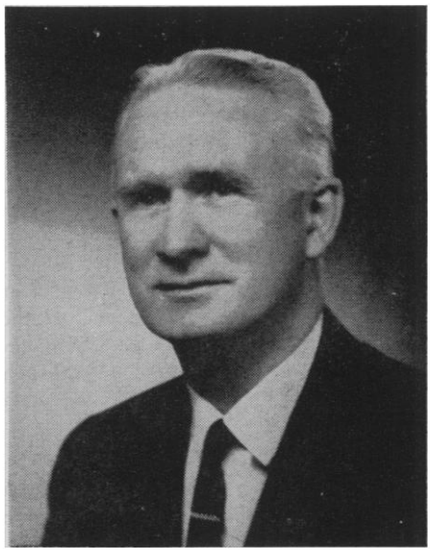
Szilard doubted that the proposed system would stop nations that do not yet have atomic bombs from developing them. He commented: "Scientists cannot bring about disarmament, but they



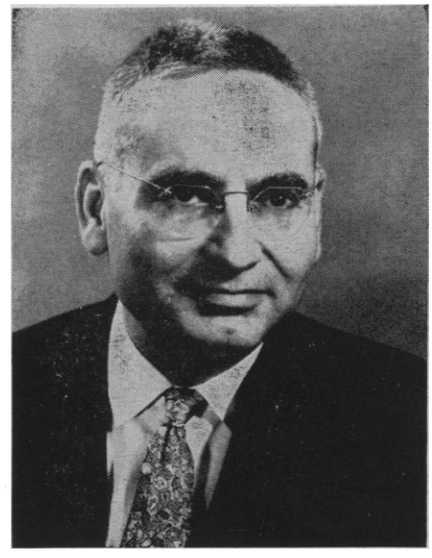
Leo Szilard



Eugene P. Wigner



Walter H. Zinn



Alvin M. Weinberg

can help police disarmament." Then he suggested that atomic-weapon scientists of all countries be brought together to work on methods of detection. He proposed that they be offered a reward of $1 million for reporting any violation of a test ban.

Fourth Berkeley Symposium on Mathematical Statistics and Probability Announced

The Statistical Laboratory of the University of California, Berkeley, announces its fourth symposium, to be held over the 6-week period, 20 June–30 July. The Berkeley symposia, which began in 1945, are organized at 5-year intervals and are meant to present cross sections of contemporary research in probability and statistics and in various fields of application of these two disciplines. The proceedings of the first three symposia were published by the University of California Press. Reflecting the growth in the theory of statistics and of probability and also the unprecedented expansion of their applications, these proceedings increased in size from 505 pages for the first symposium to 1069 pages for the third. The proceedings of the fourth symposium are expected to be even more voluminous.

The program of the fourth symposium has been arranged with the active participation of an advisory committee composed of delegates of the American Mathematical Society and of the Institute of Mathematical Statistics. Financial support was obtained from the National Science Foundation, Office of Naval Research, Office of Ordnance Research, Air Force Office of Scientific Research, and National Institutes of Health.

The program lists 116 separate papers. The subject matter of these papers falls under four main headings: theory of probability, theory of statistics, applications to physical sciences, and applications to biology, including problems of health.

The emphasis is on theory. Papers on probability are mostly concerned with stochastic processes of various types. Briefly, these are mathematical models of chance phenomena developing in time or space, or in both, in which the occurrence of an event at one point affects the probabilities of occurrence of various possible events at other points. For example, John Doe, a sixth-grader in New York, and Michael Smith, a sixth-grader in San Francisco, are both exposed to the risk of contracting measles this summer; if John Doe gets measles in May, the chances that Michael Smith will get measles in June will be slightly increased. Thus, the mathematical model of epidemics is a stochastic process.

The main subject of papers on statistical theory is the determination of optimal rules of behavior, or of decision-making, under conditions of uncertainty.

The theoretical papers to be presented at the symposium are too specialized to be intelligible to the general public. In fact, some of the titles may appear bewildering. "Almost sure nonderivability everywhere of sample curves of Brownian motion" is one example. "Optimal stopping rules and semi-martingales" is another. However, abstruse as these titles may seem, the studies of the subjects concerned have a profound influence on a great number of domains of scientific research of general interest. These are reflected in papers dealing with the applications.

Applications to Biology and Health

The applications to biology and problems of health to be discussed at the symposium include applications in the study of carcinogenesis, population dynamics, epidemiology, mechanism of drug action, and cellular phenomena. In each of these phenomena there is unpredictability of single occurrences combined with certain regularities in frequencies. Whether John Doe or Michael Smith will actually be ill with measles this summer is unpredictable. On the other hand, the frequency of occurrence of cases of measles exhibits a regularity which is one of the subjects of probabilistic and statistical study of epidemics.

The common feature of probabilistic and statistical research in the various fields of application is that efforts are made to guess the structure of the chance mechanism of the phenomena studied. This structure is represented by a combination—occasionally a very complex combination—of several simple chance mechanisms, comparable to a toss of a coin.

If one takes under consideration only one or two manifestations of a biological phenomenon—such as, for example, the age-specific death rates from cancer—the problem of a hypothetical chance mechanism reproducing the observations may not be too difficult. Essentially, this particular problem reduces to the so-called problem of curve fitting. However, its solution need not be very interesting. The really interesting and important problem of carcinogenesis is the construction of a comprehensive chance mechanism, involving elements identifiable in biological studies. The consequences of this mechanism must agree with a great variety of different manifestations of the phenomenon.

With reference to carcinogenesis, to which a considerable number of papers will be devoted, these manifestations include not only the age-specific rates but also the dependence of these rates on doses and on the methods of administering various carcinogens, the