

PHYSICS

# Nature Not Game of Chance Prof. Einstein Contends

## Says He Is Unwilling to Abandon Idea of Direct Representation of Physical Reality in Space and Time

**P**ROF. Albert Einstein, famous for his revolutionary theory of relativity, affirmed his disbelief that "events in nature are analogous to a game of chance," despite the success of the quantum theory of physics that substitutes for all previous theories of the physical world the idea that it is not possible definitely to place events in time and space.

Speaking before the Eighth American Scientific Congress in Washington, Prof. Einstein admitted that science does not have any general theoretical basis for physics which can be regarded as its logical foundation. His attempt and the attempts of others, upon which years have been spent, to develop a field theory formulation that would embrace both the immense universe and the world within the atom, have failed.

"It is agreed on all hands that the only principle which could serve as the basis of quantum theory would be one that constituted a translation of the field

theory into the scheme of quantum statistics," Prof. Einstein said. "Whether this will actually come about in a satisfactory manner, nobody can venture to say."

Science has greater security in its experimental contacts than in its logical foundations, he indicated.

"The word foundations," he explained, "in this connection does not mean something analogue in all respects to the foundations of a building. Logically considered, of course, the various single laws of physics rest upon this foundation."

"But whereas a building may be seriously damaged by a heavy storm or a spring flood, yet its foundations remain intact, in science the logical foundation is always in greater peril from new experiences or new knowledge than are the branch disciplines with their closer experimental contacts. In the connection of the foundation with all the single parts lie its great significance, but like-

wise its greatest danger in the face of any new factor. When we realize this, we are led to wonder why the so-called revolutionary epochs of the science of physics have not more often and more completely changed the foundation than has actually been the case."

The ability to predict just where something will be at some definite future time was called in question by the evolution of theoretical physics to which Prof. Einstein contributed so largely. Prof. Werner Heisenberg, German physicist, has convincingly shown, Prof. Einstein admitted, that "any deterministic structure of the nature is definitely ruled out, because of the atomistic structure of our experimental apparatus."

Yet Prof. Einstein is unwilling to believe that "we must abandon, actually and forever, the idea of direct representation of physical reality in space and time."

He promised to continue to strive for more knowledge which will allow science to predict the future as pre-Einsteinian theories of the physical world seemed to make possible.

*Science News Letter, May 25, 1940*

PSYCHOLOGY

## Parachute Troops May Be Psychological Weapon

**P**ARACHUTE troops, if they are being dropped in disguise by the Germans behind their enemies' lines, may prove of much more value in the psychological "war of nerves" than for any possible direct military advantage.

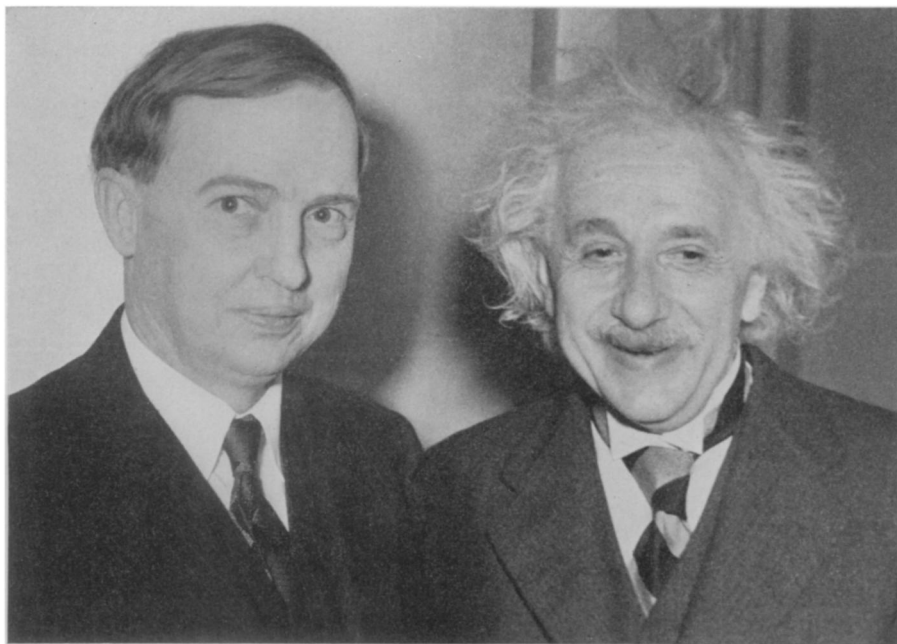
If a single Nazi fighter, dropped suddenly in Dutch uniform or civilian clothes on the Dutch countryside, can arouse suspicions among the Dutch—can make them look with fear on every stranger and distrust their own defenders—the single parachute soldier can do more harm than can tons of propaganda leaflets, or hours of radio haranguing.

Psychologists who have studied the ef-

## ● Blighting Shadow

*From the address of Secretary of State Cordell Hull on the first plenary session of the Eighth American Scientific Congress at the Pan American Union, May 13.*

"We deeply deplore the fact that a blighting shadow of cultural eclipse has temporarily fallen on so many countries in other parts of the world. We are supremely fortunate that in this Hemisphere thought is still free, and science is still untrammelled. It is for us to see to it that they remain so—for our own sakes and for the sake of all humanity."



AT THE SCIENTIFIC CONGRESS

*The Eighth American Scientific Congress heard special addresses by Professor Albert Einstein (right), of the Institute of Advanced Study, Princeton, and Dr. Harlow Shapley, director of Harvard Observatory and vice-president of Science Service.*