

## PHYSICS

# Principles of Fog Formation Given Aeronautical Scientists

Heating of All Surrounding Air Is One Way; Intense Sound Another; Neither Are Practical for Airports

ON THE 37th anniversary of the Wright Brothers' first aerial flight at Kitty Hawk (December 17), members of the Institute of the Aeronautical Sciences heard of the scientific principles of fog which still forms a major handicap to aviation.

Before a meeting held at Columbia University, Dr. Sverre Petterssen, professor of meteorology at the Massachusetts Institute of Technology, gave the fourth annual Wright Brothers Lecture, on "Recent Fog Investigations."

Fog may be removed, he said, in two ways. One is by actual physical removal of the fine drops from the air; the other by evaporating them. The latter may be done if enough heat is supplied, not only to evaporate the drops themselves, but also to raise the temperature of the surrounding air. Its relative humidity is lowered, and it can accommodate the extra water vapor produced from the drops. However, heating, over a large area, such as a harbor or airport, is impracticable, he said, because the heat must be supplied uniformly over the entire region.

Another method which, he stated, has worked successfully has been to spray calcium chloride solution into the fog. This takes moisture out of the air, and reduces the humidity, so that the fog drops may evaporate at the prevailing temperature.

Among possible means for the physical removal of the drops, he cited the use of an intense sound, the waves of which

would cause the drops to coalesce into larger drops, that would fall to the ground. However, he declared, "computations indicate that it would not be practicable in natural fog." It has been used on a laboratory scale to precipitate smoke.

Hopes that infra-red rays, that is, light waves too long to be visible, could be used effectively to penetrate fog, were dashed. Belief that this was possible, he said, was due to the wrong use of a formula for light transmission through suspended particles. This only applies, he stated, when the particles are about the same size as the wavelengths of light. Since the fog particles are actually much bigger, about one six-hundredth of an inch diameter, the light waves would have to be that size, about 500 times longer than they are, in order to produce an effect. However, waves as long as this would be absorbed by the gases in the atmosphere, and no advantage would be attained.

"There is no region of the radiant energy spectrum which will penetrate fog better than visible light," declared Dr. Petterssen. "This result has been confirmed by direct measurement."

He told the scientists that minute particles, each around a twenty-five thousandth of an inch in diameter, must ordinarily be present in the air as nuclei on which the water condenses to form the fog droplets. Ordinary raindrops, he stated, are from a twenty-fifth to a sixth of an inch in diameter.

Before his lecture, the Institute gave a dinner in honor of Dr. Petterssen. Griffith Brewer, president of the Royal Aeronautical Society of Great Britain, was also a guest, and honorary chairman of the lecture.

*Science News Letter, December 28, 1940*

## MEDICINE

## No Danger of Shortage In World's Quinine Supply

THE WORLD'S supply of quinine, "world-wide remedy for malaria," has remained in Dutch hands, free from Nazi domination, and "no danger of a quinine shortage anywhere in the world" exists.

This reassuring statement comes from Norman Taylor, Director of the Cinchona Products Institute, Inc. (*Science*, Dec. 20.)

Prior to the Nazi invasion of Holland, on May 10, Amsterdam was the headquarters of this quinine industry. On May 14, 1940, the management of this industry was transferred by royal decree to Bandoeng, Java, Mr. Taylor explains, with the "scarcely necessary" warning to have no further communication with the former headquarters in Amsterdam, for fear such correspondence would be diverted to Nazi ends.

"Java is now the center of the world's quinine industry, where ample production is assured of both cinchona bark and manufactured quinine," Mr. Taylor states. "The latter is produced at the Bandoengsche Kininefabriek, the largest quinine factory in existence. There is thus no danger of a quinine shortage anywhere in the world."

"The quinine industry, now centralized in the Netherlands East Indies, is completely Dutch and completely determined that Holland's plight shall not be turned to Nazi advantage. That attitude also actuates those connected either with the sale of Dutch quinine here or with the research and educational program of that industry."

*Science News Letter, December 28, 1940*

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