tilt forward and the craft flies like an ordinary plane.

The Army is also trying to develop a helicopter "weapons platform" with shoot-and-scoot characteristics to replace current armed helicopters.

In the past, machine guns, rockets, the SS-11 anti-tank missile and the 40-mm grenade launcher have been "rigged" for use on helicopters with varying degrees of effectiveness.

Recoil Reduced

The weapons platform being developed by Lockheed Aircraft Corporation would use the gyroscopic action of rigid rotors to absorb recoil and to keep the platform in position while it rains rocketry and gunfire on the enemy.

The Army expects to develop this aircraft and its weapons as a single, perfectly mated system, using not only new aircraft concepts but also advances in on-board armament and fire-control systems.

Still being experimented with for short-distance mobility are rocket backpacks for the individual soldier that allow him to leap over streams and other obstacles.

Anticipating these new craft, the Army is revamping its fighting units. Being tested now is the 11th Air Assault Division and the 10th Air Transport Brigade. An air assault division would replace about 2,500 wheeled vehicles of the standard division with 358 aircraft.

Field tests completed last Nov. 13 in Ft. Jackson, S.C., showed that the average air mobile unit could carry out twice as many missions as conventional units in the same time period, while exposing itself to enemy ground fire only one-sixth as long.

The air transport brigade being tested is a mixture of fixed wing craft and helicopters for hauling supplies, especially to air assault divisions. Since it costs twice as much to haul by helicopter, the brigade would have as many fixed-wing companies as the terrain in which it is to be used would permit.

Perhaps the biggest drawback to a ground force built around aircraft is its dependence on the weather. The Army, however, intends to make the air assault divisions "self-contained" so they can fight the old style of warfare, too—at least until the weather clears.

Fair weather or foul, the Army is determined to keep the sky as a vital part of its field of operations.

It will not be long before it is only a small part of the Army that will still go rolling along.

• Science News Letter, 87:26 January 9, 1965

TECHNOLOGY

'Copters in the Future To Change Our Lives

➤ THE RAPID GROWTH and use of helicopters in the future will affect almost every aspect of life, from hair styles to the very air itself.

This was the prediction of Dr. Melville C. Branch, lecturer in engineering at the University of California at Los Angeles and a member of the Los Angeles City Planning Commission.

"Although commercial and private helicopter production and travel are still in their infancy," he said, "the airborne baby is growing at a faster clip than did the automobile in its early days."

For instance, Los Angeles' only scheduled helicopter line, the world's first, carried 200 passengers in 1954.

In 1961, the load rose to 42,000, approximately doubled to 82,000 in 1962, and again to 171,000 in 1963.

What will be the impact of widespread helicopter use and how can we prepare for it? Dr. Branch speculates:

1. The city will gradually assume a new shape and skyline. Office, apartment, industrial and educational buildings will be large but limited in height to reduce traffic obstruction. Interspersed will be open areas for landing and parking, and clusters of low buildings suitable for roof-top landings.

2. Residential subdivisions may share a common landing field, and some streets could be reserved for pedestrian use.

3. Air space may have to be rationed, with the ticklish possibility that only a certain number of families on each block can be allowed to own a helicopter.

4. Urban background noise, already at a danger point, may become intolerable unless the noise level of helicopter engines and rotors can be greatly reduced.

5. Whirling rotor blades and windy take-offs may change fashions, spelling the end of elaborate hairdos and producing a further boom in ladies' slacks.

• Science News Letter, 87:27 January 9, 1965

Nature Note

Snow Crystals

➤ NOW, at a time of year when plants and trees stand bare and sere in dark winter fields, a different kind of flower fills the sky and gently covers the earth—the flowers of snow, those delicate many-petaled crystals of ice.

The lacy growths of water vapor are formed high in the cold atmosphere around minute particles of dust, clay minerals or meteor dust. Then they gently fall thousands of feet through the air to cover the earth with white silence and beauty.

With innumerable variations of intricate patterns and shapes, no two snow crystals have yet been found alike throughout the world.

Depending upon the supply of water molecules in the air and the temperatures, the shapes of these crystals range from austerely simple bars to solid triangles, symmetrical hexagons and exquisitely delicate dentrites.

Scientists have distinguished these bits of frozen precipitation into ten basic groups—the six-sided plates, the six-pointed stellars, the elongated four-sided columns, the delicate spatial dentrites, the capped columns with a crown of crystal at each end, the irregular crystals, the graupel or snow pellets that look like miniature snowballs, the fine icy particles of sleet and the ice lumps of hail that range from one-fifth to two or more inches in diameter.

• Science News Letter, 87:27 January 9, 1965