Water-Based

Before the end of World War II, seaplanes had become the stepchildren of naval aviation. Here & there a fleet of lumbering PBYs and Martins still put out on patrol, and a few floatplanes were catapulted from cruisers. But the Navy was turning almost exclusively to landplanes when the jet age caught up with naval aviation. Then seaplanes seemed to show promise again, and the waterways that cover more than half the world once more looked like useful airfields.

This week in Manhattan, Assistant Secretary of the Navy for Air John F. Floberg explained how aeronautical engineers have dug into the back drawer files and dusted off some old ideas, to start a new trend in naval aircraft. Today's high speeds, said the Secretary, mean that planes must be stronger than ever to withstand the strain. The size and weight of a seaplane hull is hardly more of a drawback than the bulky landing gear of a big bomber. Jet engines have cut down the need to raise old-fashioned seaplane propellers high out of the spray. And the hydro-ski, a beefed-up version of the sportsman's water-ski, has given the seaplane the biggest boost of all.

Mounted on a strut below a conventional seaplane hull, the short hydro-ski lifts to the surface and supports the plane's weight even at low speeds. Skimming along like a fast-moving aquaplane, it permits the plane to take off after a relatively short run. In landings, the hydro-ski takes up the first shock, lowers the hull gently to the water, and, as an added advantage, allows the plane to operate in rough seas.

In other experiments, the hydro-ski has been mounted beneath the fuselage of a sleek new fighter with no flotation gear at all. In take-offs, the fighter moves out into shallow water, its ski sliding along the bottom. As soon as it picks up speed and the ski cuts to the surface, the plane can skim over deep water for its take-off run. Once in the air, the hydro-ski can be retracted. After touching down, the pilot has to taxi fast enough for his plane to stay on the surface until he is close to beach or landing ramp.

Hydro-ski aircraft, said Floberg, would be handy in many situations for which the U.S. now has no practical plane. They could be based in the protected water of forward areas before airfields are built. In some cases they might do away entirely with the necessity of building an expensive runway on land. They could also be used to protect long-range bombers, landing at sea to refuel from submarines or high-speed surface craft.

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Still full of faith in its carriers, the Navy announced that the U.S.S. *Antietam* was in Brooklyn's Naval Shipyard for a million-dollar face-lifting. When the workmen have finished, the rear deck of the *Antietam* will angle to port so that landing aircraft will no longer head directly toward planes parked at the bow (*see diagram*).

Arresting gear—wire cables snagged by a long hook dangling from a plane's tail—will be mounted across the landing flight path, as usual. But the new, angled deck* will not need the wire barrier that once cut across the *Antietam* to keep a bad landing from becoming a disaster. Without that barrier, planes that missed the arresting gear were almost certain to damage others on the deck. Now, a pilot who overshoots the mark will have a chance to go around again. He can drag low across the landing area without crashing into the wings of parked planes, folded skyward to save space. On the new deck, a nylon net will be raised to stop planes that come in with damaged landing hooks.

Life Begins

"Life is not a miracle," says Nobel Prizewinning Chemist Harold C. Urey. "It is a natural phenomenon, and can be expected to appear whenever there is a planet whose conditions duplicate those of the earth."

Such planets cannot be rare, said Urey last week in a lecture at the New York Academy of Medicine. According to a star census taken by Astronomer Gerald P. Kuiper of the University of Chicago, there are 100 billion stars in the Milky Way galaxy, and one star in each thousand is believed to have planets circling around it. So there must be 100 million "solar systems" in the earth's galaxy alone.

Not all these planets are suitable for life. Some are too hot; others are too cold, or otherwise inhospitable. But Scientist Urey believes that many are seedbeds for the sprouting of life.

The atmosphere of a pre-life planet, Urey believes, is not like the earth's. It is highly "reducing": *i.e.*, it contains large amounts of methane, ammonia, water vapor and similar compounds, but no free oxygen. The atmospheres of Jupiter and Saturn are believed to be like this. As millions of years pass, the sun's light causes chemical reactions among the atmospheric gases. Larger molecules begin to form (*e.g.*, aldehydes, amines, organic acids), and they rain down into the oceans below. There they react with one another and with dissolved salts. All possible chemical compounds are formed eventually, and the ocean becomes a rich solution of them.

After a billion or so years of such pre-life evolution, theorizes Urey, the blind forces of chemical attraction accidentally create a single molecule which has the ability to absorb other molecules and create a replica of itself.

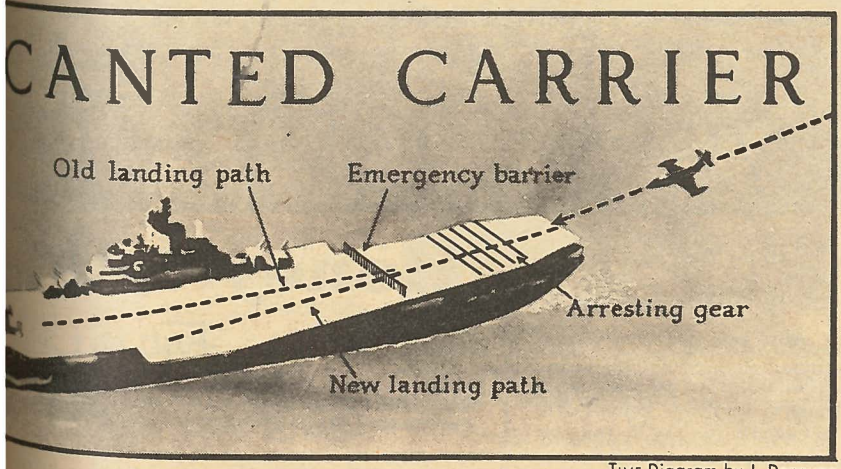
This molecule is alive, for the great test of life is ability to reproduce. It has no living enemies. Swiftly it multiplies, feeding on the nutritious chemicals in the ancient sea. Soon the water is populated with hungry molecules, which differentiate swiftly into many types.

At last one of them learns to extract energy from the sunlight, releasing oxygen into the air and absorbing carbon compounds. When these living forms—the first plants—have multiplied for a few million years, they create the oxygen-rich atmosphere that the earth now knows. Then oxygen-breathing plant-eaters evolve to devour the plants, and the full stream of evolution is under way.

Dr. Urey has no tangible proof of this theory. But he is hopeful of two investigations now in progress. One, conducted by one of his students at the University of Chicago, is to expose a synthetic reducing atmosphere of methane, ammonia and water vapor to ultraviolet rays. If organic compounds are formed, it will be proof that they could be formed in the atmosphere of a pre-life planet.

The other proof is being sought by studying Titan (one of the satellites of Saturn), which is somewhat bigger than the moon. Titan is far from the sun and certainly too cold for life as the earth knows it, but it has an atmosphere containing much methane. Chemist Urey hopes to find that sunlight is slowly making organic compounds out of this simple gas. If Titan were warmer and bigger, the process might already have clothed it with oxygen—and life.

* The U.S. Navy calls it a "canted" deck; the British, with a greater respect for the language, call it an "angled" deck.



TIME Diagram by J. Donovan