

AERONAUTICS

New Safety Aviation Fuels Decrease Flying Fire Hazard

Aeronautic Meeting Learns That New Gasolines Can Give Performance and Economy of Present Fuels

TESTS at the research laboratories of the National Advisory Committee for Aeronautics, at Langley Field, Va., have just proved that new types of safety aviation fuels can give performance and economy equal to that of the risky super-gasoline now used by aviation.

A great advance in aviation safety will come from the new knowledge as soon as it can be taken out of scientific laboratories and used commercially.

Safety aviation fuels are now made synthetically in the laboratories of science but can be produced on a commercial scale as soon as the demand for them arises. Their cost will probably be no more, for large production, than the cost of the high-test, anti-knock gasolines now used in airplanes.

The National Aeronautic Meeting in Washington, sponsored by the Society of Automotive Engineers, was the scene of the new important announcement as Oscar W. Schey, mechanical engineer of the N.A.C.A., described his tests on the performance of aviation engines using fuel injection.

In these experimental engines the fuel is not sent through a carburetor to be vaporized in the usual way. It is forced,

under pressure injection, directly into the firing cylinder where it is ignited by an electric spark. It is this fuel injection method which permits the use of the newly created safety aviation fuels.

Characteristic of these new fuels is their high flash point. Where the vapors of some aviation gasolines will ignite, or flash, at temperatures as low as 30 degrees below zero, Fahrenheit, the new safety fuels are so made that their vapors will not ignite, or flash, until the temperatures reach 100, 134, or even 164 degrees.

Using the safety fuels in airplanes will greatly diminish the risk of fire hazard when accidents occur. This potential increase in safety has long been realized but it remained for the N.A.C.A. tests to prove that the safety fuels could be used without any loss of power output or desired economy of fuel consumption.

The N.A.C.A. tests were made, it is true, on small one-cylinder experimental engines, but engineers see little trouble in adapting the fuel injection methods to large multi-cylinder engines which are adaptable for installation in transport airplanes.

Fuel injection for engines, instead of

carburetors, has another advantage stressed at the National Aeronautic Meeting.

In a report by C. F. Bachle of the Continental Motors Corporation it was explained that within the last year fuel injection has been adopted for light aviation engines in private planes. Mr. Bachle stressed that fuel injection eliminates the risk of ice forming in carburetors. The rapid vaporization of gasolines so cools the carburetor that water vapor is sometimes frozen to ice in it, with fatal stalling and disaster.

The fuel injection systems for light planes are used with current aviation gasoline. With suitable changes in the engines it might be possible to adapt them for the safety fuels with which the N.A.C.A. has been working, so that additional safety from fire hazard could also be obtained for the private pilots.

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Light Aviation Engine

A NEW type of experimental airplane engine that weighs only 0.6 pound for every horsepower it develops was described at the National Aeronautic Meeting.

The new engine is of the Diesel type, only four feet long, with 18 cylinders. Weighing 3,000 pounds, it could be developed to deliver 5,000 horsepower, said E. S. Hall, avia- (*Turn to next page*)

CONSERVATION

Face Seventh Season of Fighting Coal Fires

CCC WORKERS in Wyoming are preparing for a new campaign in what has proved to be a Seven Years War against the nation's hottest and most destructive fires. For the seventh spring, they will go into the line to fight fires that are devouring some of the nation's biggest and best coal reserves.

Fighting the coal fires is not done with conventional hose-and-nozzle equipment. The weapons are power shovels, tractors, wheelbarrows and spades. Burning masses of coal are dug out and smothered with packed earth.

Sometimes the heat is volcano-like, melting the soil. Working periods on occasion have been shortened to as little as ten minutes. Yet despite the laboriousness and extreme hazards of the work, the CCC forces engaged have not had a single major accident during their operations since 1933.

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BATTLING SEVEN-YEAR FIRE

tion consultant and mechanical engineer, who described it.

Mr. Hall said that improvements in current radial type airplane engines are producing only a small overall gain in performance because the region of diminishing returns is being approached. He urged that a barrel-shaped engine design be tried with a small frontal area to cut down wind drag. "You wouldn't shoot a bullet crosswise," he declared, in characterizing the air resist-

ance of the radial type airplane engines.

Best engine used in the new Martin bombers of the U. S. Army Air Corps weighs 1.2 pounds per horsepower developed. A few experimental motors have attained 0.98 pounds per horsepower they develop. If the Diesel engine described by Mr. Hall can be made practical it would cut weight per horsepower by 33% and be a revolutionary advance in aviation.

Science News Letter, March 30, 1940

WILDLIFE

Good Fishing Requires Planning and Hard Work

Stocking Streams and Lakes With Fish Requires More Than Merely Dumping Fish Into Unpopulated Water

FISHERMEN, casting carefree flies over trout streams in national and state parks and forests, are not getting the benefit of an equally careless bounty of nature. A great deal of careful human planning and hard work—not to mention public funds—stands unobtrusively behind the scenes in every fishermen's paradise.

What stocking streams and lakes with fish really means was brought out sharply in a series of discussions before the meeting of the Fifth North American Wildlife Conference in Washington. Participants included Willis King of the National Park Service, R. R. Hill and Ancil Holloway of the U. S. Forest Service, C. Willard Greene of the New York State Conservation Department and a number of other speakers.

Many persons, including some of the most enthusiastic sportsmen, seem to have the idea that stocking empty water with fish requires only the dumping in of a quantity of young fish—any kind of fish—and the more the better. Mr. King cited an actual case, in which 65,000 warm-water fish such as catfish and crappies were planted in a 70-acre lake created by a dam. Then several thousand rainbow trout (a cold-water species) were added. Obviously, a lot of fish (and hence, not a little money) went to waste there, not only from overcrowding but from the promiscuous dumping in of species which could not have lived in the environment under any circumstances.

Proper stocking needs thorough ecological investigation of the area to be

stocked first of all, then proper planning to fit the best-adapted fish into the environment in such numbers as not to exhaust the food supply and at the same time to meet as well as possible the demands of the ultimate consumer, the angler.

Mr. Hill told of a planning program worked out in one specific major fishing area, Michigan, in which not only these requirements are met but the sometimes overlapping activities of several public and private agencies, all eager to keep the streams well filled with fish, are coordinated and kept from wasteful duplication. This scheme was put into operation for the first time last year, and further developments are looked forward to with interest.

The amount of stocking that has to be done in some waters is astonishing. Mr. King spoke quite calmly of having to meet the needs of a hundred or more fishermen per mile, in some of the trout streams of the Great Smokies. To take care of such a situation, the fisheries men must stock the streams not only with large numbers of the customary fry and fingerlings, but with full-sized trout from the rearing ponds of the hatcheries. After allowing a suitable period for the fish to become suitably "wild," the streams are opened to the anglers.

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Crows Destroy Ducks

CROWS are destructive enemies of wild ducks' nests, at about eight of the great refuges that have recently been

established to encourage the broadbills comeback, Merrill C. Hammond of the U. S. Biological Survey reported to the Wildlife Conference as a result of his studies on the predations of the black thieves.

Key to crow danger to ducks consists, at least in part, in the presence of suitable nesting areas for the crows near the nesting areas of the ducks. Where crows were not abundant, ducks suffered little. Counter-attacks on crows by the guardians of the ducks were usually followed by an improvement in the nesting situation.

Ducks may hide their nests very cleverly from human eyes, but that does not seem to save them from the crows. Indeed, Mr. Hammond stated, it seemed to be just these better concealed nests that crows were most successful in seeking out and robbing.

Certain species seem to suffer more from crow predation than others. Unfortunately, favorite duck species like mallard and redhead are among the more commonly attacked.

The crows, of course, are after the eggs for food. Attacks are most apt to occur during the laying period, when the nests contain eggs but are left uncovered during daylight hours while the parent birds are out feeding. Once incubation has commenced and the eggs are kept covered most of the time, the number of attacks diminishes.

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Houses for Ducks

IF YOU were suddenly asked, "What birds nest in hollow trees?" you would, of course, instantly answer, "Woodpeckers." It might come as a surprise to learn that some ducks also nest in hollow trees—unless you know your wood ducks. Wood ducks are the objects of special solicitude on the part of wildlife restorers.

In many prairie state areas there are not enough hollow trees for the needs of wood ducks, it was pointed out to the Wildlife Conference by Arthur S. Hawkins and Frank C. Bellrose, Jr., of the Illinois Natural History Survey. For this reason, wooden "bird houses" of inviting shape have been devised, and have received the approval of the ducks. Last year, over half of 350 board boxes set up on the bottom lands near Havana, Ill., had broad-billed tenants within four months. Further extension of the duck housing program is contemplated for the coming season.

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