AVIATION

Poor Military Aircraft Must Be Avoided Through Research

National Advisory Committee for Aeronautics Lists Questions on Which Experts Advise Concentration

IT WOULD be as disappointing and disastrous for the United States to produce inferior military aircraft "as it is to try to win on the second best hand in a poker game," the National Advisory Committee for Aeronautics warned in its annual report transmitted by President Roosevelt to Congress.

"Without up-to-date, reliable results of scientific laboratory research, our Army and Navy would not be able, even with the most sincere cooperation of the industry, to design and produce aircraft with any assurance that they would not be 'second best' in time of war," the report continued.

But the Committee, which is the government's aeronautical research organization, expresses its belief that its laboratories, located at Langley Field, Va., are as yet unexcelled by those of any other single nation, despite the recent great expenditures on research organizations abroad.

The N.A.C.A. attempts to look in the future and anticipate some of the problems that may rise. Some of these are:

What are the maximum requirements for military and commercial aircraft going to be?

Will speeds in excess of 400 miles per hour be required?

How much will the size of commercial aircraft exceed 50 tons within the next few years?

What are the problems that will require scientific analysis before such craft can be successfully designed and constructed?

What of Airships?

Will airships be further developed for naval use or for transoceanic transportation and, if so, what are fundamental problems the N.A.C.A. should investigate?

Aeronautical research problems pressing for immediate solution, as listed by the N.A.C.A., are: The need for devising a method for studying the stalling characteristics of highly tapered wings; the determination of the necessary load factors and their variation with size and speed; the problem of reducing or eliminating if possible the formation of ice on wings, propellers, and control surfaces, and of providing effectively for the automatic removal of ice when it does form; problems involved in the design of wings, control surfaces, and flaps, as well as other devices to secure better control at low speeds incident to taking off and landing; problems of suppressing vibration and flutter, improving engine and propeller efficiency, capacity, and dependability, extending the range, enlarging the capacity, and at the same time constantly increasing the speed and safety of aircraft.

Science News Letter, January 22, 1938

ENTOMOLOGY

Transparent Plastic Used To Preserve Insects

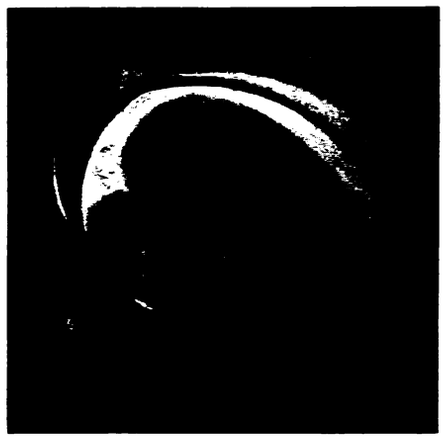
PRECIOUS amber, prized by mankind as a gem and by the scientist for the remains of long-extinct insects preserved in it, has a modern rival in a new technique for preserving insects in transparent plastic materials.

Details of a process for putting insects inside a preserving shell of synthetic resin are independently reported by Dr. J. H. Hibben of the Geophysical Laboratory, Carnegie Institution of Washington, and Dr. Charles E. Sando of the U. S. Department of Agriculture.

Insects can be preserved intact inside the resin shell in much the same manner as insects that died thousands of years ago are today preserved in million-year-old amber, the fossilized resin of trees long extinct.

Using compounds with jaw-breaking names such as methyl methacrylate, the two scientists have succeeded in protecting the insects from the ravages of daily moisture changes which damaged unmounted specimens.

Theoretically simple—merely causing resin to form around the insect—the process entails a fair amount of painstaking work, requiring considerable patience and much skill. The specimen to be mounted must first be dried, without changing the colors or shape, then immersed in the compound and kept under heat and pressure until new compounds, called polymers, are formed in the original preservative.



MODERN "AMBER"

A long-horned beetle "under glass." The beetle is preserved inside a block of transparent plastic material. A special technique is required to mount specimens by this new method.

Drs. Hibben and Sando have succeeded in mounting insects, dry plant materials and a host of inorganic substances in plastic blocks. Using other methods, G. R. Fessenden, of the Department of Agriculture, has worked out means for "fixing" the colors and shapes of growing plants, so that they too may be mounted in plastic shells. Leaves and flowers, just as they come from the field, can be mounted to protect them from damage and preserved in a "fresh" state indefinitely.

Science News Letter, January 22, 1938

MEDICINE

Research on Polio Takes New Angle; Virus Strains Differ

A NEW lead on the fight against infantile paralysis appears in research reported by Drs. James D. Trask and John R. Paul of Yale University School of Medicine to the journal, *Science,* (Jan. 14.)

Efforts to prevent the disease by nasal sprays of chemicals to block the nerve of smell have been based on the generally accepted belief that the virus which causes infantile paralysis enters the body through the nasal endings of the nerve of smell. The Yale investigators now have evidence which casts some doubt on all of this.

Some strains of infantile paralysis virus will cause the disease in a large per-

centage of monkeys when simply injected under the skin, Drs. Trask and Paul found. These virus strains were recently isolated, some of them coming from patients in the Toronto epidemic last summer. Older virus strains, obtained long ago and kept growing in laboratories for years, rarely produce the disease unless injected into the nasal cavity.

The difference between the strains may be only a coincidence, the Yale investigators point out. If it is not coincidence, it is obvious, although the scientists say nothing of this, that the fight against the childhood plague will have to be approached from a somewhat different angle.

Sulfanilamide No Help

Sulfanilamide, the new chemical remedy that has apparently been conquering one infectious malady after another, is probably not going to be any help against virus infections like infantile paralysis. Research indicating this is reported by Drs. Earl B. McKinley, Ellen Gray Acree and Jean Sinclair Meck, of George Washington University School of Medicine to the same journal.

These investigators tried sulfanilamide as a remedy for infantile paralysis in monkeys and for two other virus-caused diseases in rabbits, but the new chemical failed to save the lives of these animals. All but one monkey died.

The explanation, Dr. McKinley suggests, is that sulfanilamide is unable to exert its action against a disease germ when the latter gets inside body cells, as viruses do. In the diseases for which sulfanilamide has proved an effective remedy the causative germs are bacteria of a type which live between body cells rather than inside them.

Science News Letter, January 22, 1938

FOR SUGAR

Insects, both destructive and beneficial, are gathered from the tropics of all the world, in efforts to place sugar cane growing on a more scientific basis. Here, Dr. F. X. Williams, Hawaiian entomologist, examines a collection from Guatemala.

ENTOMOLOGY

Hunt in New Guinea for Foe Of Sugar Cane Insect Pest

When Killer Ally Is Found Then Long Difficult Feat Of Transplanting Him to Foreign Soil Will Begin

DEEP in the wilds of New Guinea lurks a killer insect without a name. A party from Hawaii is slashing its way through the jungle, risking death from disease and possibly unfriendly natives, determined to "get their bug."

Not that they intend to drag their six-legged quarry back to the bar of civilized justice. Quite the contrary; they approve the creature's lethal activities, for it is one of the insects that unconsciously fights man's battles by killing other insects that are harmful to his crops.

This particular insect is an enemy of the sugar cane borer, one of the most destructive pests both in Hawaii and in the sugar area of the mainland United States. It is hoped that it can be transplanted and acclimated first in Hawaii, and then possibly also the rest of the way across the Pacific.

The new insect ally of sugar cane planters was discovered quite by accident. A scientific exploring party was sent out by the Hawaiian Sugar Planters' Association, under the leadership of Cyril E. Pemberton, to seek new types of wild cane. Their boat was wrecked on the New Guinea coast.

Thrown onto a forbidding and possibly hostile shore, the party occupied itself with forays into the jungles while they waited for help. They discovered a patch of cane, close to a swamp. Some of the stalks were afflicted with borers. They opened these up—and found the long-sought enemy of the pest.

Marking the place of discovery, and trusting the insect's descendants would still be there when they returned, Mr. Pemberton and his party journeyed on to Honolulu. Elaborate preparations are being made for the insect's importation. With acclimatizing stations established possibly in Samoa, Fiji and New Caledonia, the attempt will be made to transplant it to Hawaii.

Life spans of such insect allies, and the tremendous distances over which they must frequently be brought, make it impossible to carry individual insects through. The originals are generally established near their homeland, where they can be watched and their food requirements studied. Insects on which they feed must be similarly treated. In some cases a whole coterie of enemies of various types must be captured, studied and carefully reared to get a single one through, and a failure in preserving any one type may destroy the chances for the entire expedition.

Similarity of climates must also be taken into consideration. Too great a change in one step may spell disaster. It is nothing unusual for a year or more to be spent in carrying a single desired insect over a few thousand miles.

Successfully transplanted, there is still the very definite danger that in the insect's new homeland his life characteristics may suddenly change. An originally valuable species, after acclimatization, may lose its interest in hereditary enemies and be utterly valueless as an ally to science. Even more serious, it may suddenly be imbued with the inclination to cooperate with established pests, and itself become a menace that forces instant eradication.

New insects, life forms, plant species, etc., must therefore be placed in isolation wards where they can be watched under Territorial conditions. Imprisoned in limited areas, insects and plants are placed with them, and more months allowed to pass while constant check is kept of developing tendencies. Only after positive proof of benefit are the doors opened and the new ally installed in the field.

Science News Letter, January 22, 1938