SCIENCE NEWS

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MOLDED PLASTIC AIRPLANES

FOUR aircraft companies and two research laboratories are aggressively attacking the problem of molding airplanes out of plastics for American defense, according to *Modern Plastics*. Army, Navy and civil aviation authorities, and the airplane industry in general, are watching these experiments to determine the place of synthetic resins in the future of aircraft.

So far the use of resins has been limited to experimental models of training and light commercial planes and the quantity production of minor airplane parts. In airplane structures, such as wings and fuselage, the resins are used very much as glues were in the days of the first World War, with wood veneers used as the reinforcing agent. The molded airplanes are really of plywood resin-bonded construction. Unlike the early glued plywood airplanes, the resin-bonded modern craft are said to be stable and unwarped under all atmospheric conditions, free from internal strains and proof against molds, fungi, water, oil and gasoline.

A five-place Fairchild Model 46, with molded fuselage and wood wings with resin-bonded plywood covering, was first flown three years ago and is today in active service. The Fairchild-owned Duramold Aircraft Corporation has a new molding process that uses a rubber bag as one half of the form. The other non-flexible half is made of sheet steel, cast metal or wood. The advantage of this method is that the flexible die assures equal pressure over all surfaces whether curved or not, which is not possible with conventional hydraulic or mechanical presses. Fairchild PT 19 training ships now in quantity production use plastic plywood spars which are said to be less costly and stronger than solid spruce.

The Summit plane, now undergoing government tests, was molded by Aircraft Research Corporation of Bendix, N. J., and is believed to be the first completely molded airplane body in the world. Wings, fuselage, tail assembly and controls were molded as complete structures. It is claimed that whereas a commercial plane equipped with 75 h.p. motor will cruise at 95 miles per hour, the Summit plane similarly powered will cruise at 125 miles per hour because all surfaces are smoother. The Vidal process used employs thermosetting and thermoplastic types of resins for bonding plywood veneer. The same manufacturing methods are being used to make boats, skis, racquets and automobile parts. Its first plastic-plywood airplane, a primary trainer, was flown recently by the Timm Aircraft Co. of Van Nuys, Calif. In properly contoured forms, spruce veneers are superimposed one upon another, using a thermosetting phenolic resin applied on each layer during assembling.

A fellowship on plastic airplane construction has been established at the Mellon Institute, Pittsburgh, by the Glenn L. Martin Co., looking toward the mass production of airplanes from plastics instead of by the slower riveting and welding of metals. In the plastics section of the National Bureau of Standards there is a research group working on a National Advisory Committee for Aeronautics project to develop factual information on the physical properties of reinforced plastics. Eighteen synthetic resins for impregnating and bonding wood veneers have already been tested.

In dozens of minor ways plastics are entering into aircraft. Instruments have phenol-formaldehyde housings. Windows in transport and military planes are made of acrylic resin sheets. Propellers are made from wood laminated with plastic. Coatings are made of synthetic resins. —WATSON DAVIS.

THE SHORTAGE OF TIN IN GERMANY

GLASS is being widely used by German manufacturers as a substitute for tin cans; so extensively, in fact, that the glass container industry is unable to supply all the demand even though working at full capacity. This information has reached the Bureau of Foreign and Domestic Commerce of the Department of Commerce from the American Consulate General at Frankfort-on-Main.

Even prior to the outbreak of war, the bureau is advised, it was necessary to institute extensive measures of economy and substitution in the use of packaging materials, and during the war these measures have become greatly intensified. The shortage of packaging-material arises from the fact that, to a high degree, the nation is dependent upon foreign sources for the requisite raw materials—wood, wood pulp, tin plate, jute and other fibers, etc. The leading packaging materials obtainable from domestic sources are glass and plastics, and so great is the demand for substitute containers made of these materials that the producing companies are now taxed to the utmost capacity.

In addition to glass for tin plate, other substitutes are of paper for jute sacks, paper for wood, and impregnated cardboard for metal sheet. Old containers are being carefully salvaged and used again, but this is made difficult by the shortage of railroad rolling stock, and the restrictions on automobiles, so that transport charges for empty containers are high.

Another substitute for tin plate is sheet metal covered by a film of synthetic resin. Collapsible tubes are being made of plastics at the rate of a million monthly. Additional savings have been effected by dispensing altogether with packing for some materials, such as soap; by using cheaper rather than more expensive type of paper; and by prohibiting the use of cartons and outside containers for products already in paper wrappers.

DOUBLE SNEEZERS

THE way you sneeze, if you do it in some peculiar individual fashion, may be inherited, it appears from a report by Dr. Milton H. Erickson, director of psychiatric research and training at Eloise, Mich., State Hospital, in the current issue of the *Journal of Genetic Psychology*.

Dr. Erickson reports finding double sneezers in three generations of the same family: mother, daughter and granddaughter.

A double sneezer is a person who always expects and usually experiences a second sneeze in rapid succession to the first, usually within one to two seconds, rarely longer. With the hay fever season in full swing, you may be able to observe some double sneezers yourself.

In the group Dr. Erickson reports, the double sneeze pattern was first observed in the young woman of the middle generation. Her relatives and friends thought it was an acquired mannerism, possibly the result of having as a child copied someone or done it as a trick until it became an ingrained habit that persisted after the trick or the imitation was forgotten.

The young woman herself, however, "regarded it as an innate, rather than as an acquired pattern of behavior over which she had no control, constituting nothing more than an amusing physiological peculiarity. She offered the explanation that it might be similar in character to the frequently encountered sneeze reflex to bright light or temperature changes."

When, however, this young woman's three-weeks-old baby started double sneezing, even making faces after the first sneeze as if expecting another, just as the mother did, Dr. Erickson began to wonder whether the pattern was not inherited. It was not possible for the tiny baby to be imitating her mother, much less double sneeze as a trick.

The baby's mother had thought she was the only one in her family who double sneezed, but after her baby started doing it, she discovered that her own mother, the baby's grandmother, had the identical double sneezing pattern.

This might all be coincidence, rather than inheritance, Dr. Erickson says. In favor of the inheritance idea he refers to the report of two New York scientists, Dr. C. Landis and Dr. W. Hunt, that "complicated bodily responses exist and are exhibited in a pattern-like fashion" —among the responses being sneezing and coughing—and that the general pattern of these responses tends to remain constant regardless of age, sex and race.

"To this may be added," Dr. Landis concludes, "that variations in the pattern may be inherited."—JANE STAFFORD.

CHILD CRIPPLES OF THE UNITED STATES

NEARLY 250,000 crippled children—a pathetic army of victims of infantile paralysis, burns, rickets, and other crippling misfortunes—are now doing their bit toward helping themselves and other cripples by having their cases recorded on state registers, according to the latest figures issued by the U. S. Children's Bureau.

Over 99,000 crippled children were added to state registers last year, a rapid net gain of 77,000 toward the goal of recording facts about all crippled children of the country. The number of such children is believed to be about half a million. Among the young cripples removed from the registers last year as having reached 21 years, or for other reasons, were 7,000 reported cured.

While the state registers were established originally by state agencies helping crippled children under the Social Security Act, the recording of all crippled children, not merely those given state aid, is urged. Medical diagnoses and other facts thus recorded are regarded by the bureau as highly valuable in attacking this large problem.

Most numerous among child cripples are found to be infantile paralysis victims, analysis of 188,579 cases on the registers shows. Over 36,000, or 19 per cent., owed crippling to infantile paralysis; 19,000 had spastic paralysis; 14,000, clubfoot; 11,000, the bone infection known as osteomyelitis; others suffered from burns, tuberculosis of bones or joints, harelip or cleft palate, rickets, and other troubles.

SCIENTIFIC RESEARCH AT THE NEW JERSEY EXPERIMENT STATION

RESULTS of scientific research, ranging all the way from chemicals for driving off mosquitoes to calves whose mothers never saw their fathers, were shown at Rutgers University on August 19 to a group of visiting editors, publishers and radio broadcasters. The demonstration was under the direction of Dr. W. H. Martin, dean and director of the College of Agriculture and the Agricultural Experiment Station.

Because of the proximity of areas of light, fertile soil to great urban centers of consumption, New Jersey has long been famous as a truck-raising state. Prominent in the exhibits were some of the newest products of the vegetable breeder's art, notably hybrid corn and pedigreed tomatoes.

New Jersey was also the first state in which long-distance breeding in cattle was put into practice by cooperatives organized for this purpose. In this type of breeding, one high-grade bull can sire calves over a radius of many miles without ever leaving his own pen or having any of the cows brought to him. An extreme case of distance in artificial insemination occurred when a bull in Idaho became the father of a calf in New Jersey, through the agency of air express.

Mosquitoes have lost some of their terror in what used to be thought of as the number one mosquito state, since investigators worked out a new and more effective spray. The new mosquito repellent has even been used by expeditions in the African bush, to keep away the dreaded tsetse flies.

Chemical warfare against another class of enemies, in the soil rather than the air, is exemplified by new types of soil disinfectants that kill off harmful fungi and bacteria. Vegetables, flowers and field crops grown in soil thus cleared of invisible enemies bring in good yields, while similar plantings in unprotected soil frequently turn out total failures.

THE HUMMING-BIRD

THE humming-bird is easily the quickest thing in feathers, and probably the most skillful of all flying creatures, is stated by Dr. Winsor M. Tyler in a new publication of the Smithsonian Institution.

The bird's wings are tiny, but powerful for their size. They beat at a rate as high as 75 times a second; when the bird is "standing still" in the air the rate is 55 beats a second. Seven hundredths of a second is all the time a humming-bird needs to get off a perch. Straight-ahead flight reaches a speed close to 50 miles an hour.

Humming-bird nests are tiny but beautifully constructed, lined with soft plant down and covered with bits of lichen.

Usually the female does all the building. The young are no bigger than peas, naked, probably blind and helpless when hatched. They grow very rapidly, however, and in two weeks are as big as their parents and ready to leave the nest. Then the family breaks up and the parents separate and go back to single life.

Humming-birds make long migration flights, timing their travels to correspond with the blossoming of the flowers that supply their food. They not only sip nectar but eat large quantities of insects. Their appetite for sweets is phenomenal. They have been known to eat two teaspoonfuls of sugar daily—about a third of their own weight in sugar.

For all their daintiness, grace and beauty, humming-birds have tough dispositions. They bicker with each other in rasping little, mouselike voices. And they viciously attack birds many times their size, darting and diving at them, depending on speed and agility to gain immunity from any counter-attack by the victim.

FOSSIL INSECTS IN RUSSIAN DEPOSITS

FOSSIL remains of insects that lived thirteen million years ago in what is now the northern Caucasus region of the USSR have been found in large numbers by an expedition of the Russian Academy of Sciences. About 3,500 specimens have already been removed, according to *Tass*, the official Soviet telegraphic agency.

The finds were made near the town of Voroshilovsk. The region is arid and highly saline now, but in Miocene times there must have been abundant fresh-water pools, for the insect fossils are those one would expect to find on the shores of summer ponds; flies, dragonflies, and a great many mosquitoes.

The soft, silty mud, which hardened into stone ages ago, must have been in exactly the right condition then to hold the insects it caught and to preserve the imprint of their bodies perfectly. Notable among the specimens collected are sixty butterflies, in which not only the wing-nerves are in perfect condition, but the outlines of the scales with which the wings were covered.

Perfection of this degree, in fossil insects, has hitherto been found only in the rock strata of Florissant, Colo., and the region around Spokane, in this country, and in some of the great lignite pits near Halle, Germany.

ITEMS

A NEW wilderness area of 370,000 acres has been set aside in the Maritime Province on the Pacific shores of Asiatic Russia. Its primary objective is to preserve intact forest growths of a number of notable tree and other plant species that were more wide spread before the great Ice Age of a million years ago, but which have become extinct elsewhere in the world. Animals of equally ancient lineage roam the woods, including spotted reindeer, Ussurian tiger, Himalayan and Ussurian bear and Manchurian hare.

OREGON STATE, 100; Big Blaze, 0. Scores like that will be tried for by teams of college men at Corvallis, Oregon State College, under the direction of the U. S. Forest Service. The game is more strenuous than even big-time football, and it is played "for keeps"—it is fighting forest fires. The teams are to consist of twenty-five men each, all picked for size, strength and endurance and trained for skill and teamwork in combating forest fire. Stationed at CCC camps in the timber country, they will "sleep with their boots on," ready to go into action day or night, at the first drop of a spark. Between fires, the men will work on regular forestry projects, at $30 a month. While fighting fires they will receive in addition regular forest fire wages.

FARM population in this country is still increasing, according to estimates of the U. S. Department of Agriculture. As of January 1, 1940, the American farm population was placed at 32,245,000, which is an increase of 186,000 over 1939. The increase, however, has occurred mainly in areas not well adapted to commercial farming. In the richer, commercial-farming regions there was enough migration away from the farm during the past ten years to have brought about a reduction in farm population.

CORN roots push themselves deep and far through the soil, yet the ones that are nearest the parent plant are most efficient in absorbing water. This has been demonstrated in the experiments of Dr. Charles H. Davis, of the University of Arizona. Dr. Davis grew young corn plants in boxes of soil which permitted the development of a four-foot spread of roots. Each box was provided with one glass side, so that the roots could be accurately counted and measured. Measurements of soil moisture, taken every four inches along the length of the boxes, showed that roots nearest the plants absorbed water faster than did longer roots pushing out to greater distances. Not only that, but the shorter roots were able to extract water from soil dried to a point at which the plants theoretically should have wilted, and at which they actually did wilt when the roots farther out had to attempt the task of extracting water a little later on. Dr. Davis's experiments are reported in detail in the *Botanical Gazette*.

THE longest-tailed bird for its size ever found is a new bird-of-paradise species newly added to the collections of the Australian Museum at Sydney. The bird, which trails a three-foot tail after a nine-inch body, was collected in New Guinea by J. L. Taylor and J. R. Black, leaders of the recent Hagen-Sepik patrol. The long tail, which grows only on the male bird, consists mainly of two ribbon-like white plumes. The body and wings are brown, with metallic green throat and head. At the upper base of the bill there is a large tuft of velvety feathers shot with green, while a fiery copper band runs across the chest. The female is reported to be a plain brown bird. Like all its tribe, this new bird-of-paradise concentrates its beauty in its feathers. Its voice is described as a clicking or hammering noise, like a riveter at work. It has been given the name McNicholl's ribbon-tailed bird-of-paradise, after Sir Walter McNicholl, Administrator of New Guinea.