ENTOMOLOGY

Learn From Yellow Jackets

Yellow jackets, best known for their sting, should have taken patent rights on insulation and air conditioning of homes, scientist says.

➤ YELLOW JACKETS, best known for their sting, almost certainly gave man the idea for making paper from wood pulp and should have taken out patent rights on the insulation and air conditioning of homes, declares Dr. R. I. Sailer of the U. S. Bureau of Entomology and Plant Quarantine. He bases this on his observation of temperature regulation in one yellow jacket nest at the Michigan Biological Station.

The average temperatures inside the nest during a four-day period at the peak of brood-rearing activity was kept at 91.6 degrees Fahrenheit. At no time was it higher than 95.6 or below 87.8 degrees. Outside temperatures for the same period averaged 82.1 with a range between 65.4 and 107.6 degrees.

Unlike most yellow jacket nests this one was located in an exposed position and had only the paper layers of the envelope to protect the brood chamber from the influence of the outside weather. When first examined on July 10, the nest was three inches in diameter and had four layers of paper in the protecting envelope. At this time the average temperature was 85.5 degrees.

By Aug. 1, when the nest temperature was highest and most stable, the nest was five inches in diameter and the cover contained 12 layers of paper. After Aug. 1 the nest did not increase in size and the colony's ability to regulate temperature began to decline. Since nests are normally occupied for only one season, this decline was not unexpected though it may have been premature.

For many years it has been known that honey bees regulate the temperature within their hives. In winter quarters the temperature is not allowed to fall below 57 degrees and in the summer, during periods of comb building and brood-rearing, the average temperature is between 92 and 93 and is held within a range of from 85 to 97 degrees.

It would therefore appear, states Dr. Sailer, that the brood of the honey bee and that of their rather remote relative, the yellow jacket, have strikingly similar temperature requirements.

Science News Letter, June 2, 1951

METEOROLOGY

Radar Spots Hail for Planes

➤ RADAR MAY soon be able to tell airline pilots whether they are running into dangerous hailstorms.

There is real hope, said H. T. Harrison, director of meteorology of the United Air Lines, and W. B. Beckwith, also of the United Air Lines, that further experience with radar, "will develop techniques which will actually accomplish this and thus go a long way toward putting thunderstorm navigation on a more precise basis."

Radar is already effective in indicating thunderstorms to the pilot, they said, but there is no way of knowing which storms contain hail of a size which would be damaging to a plane. However, they said, 90% of all hail encountered in the air in American Airlines-Navy flight tests occurred when the radar scope indicated that light rain was changing abruptly to heavy rain.

The two weather men reported their findings in the BULLETIN OF THE AMERICAN METEOROLOGICAL SOCIETY (April).

They based their opinion on a detailed study of hail as it affects airline operation. Different insurance company hailstorm insurance rates, reports of damage to planes in flight over the past ten years and results from special observation stations showed that the greatest danger from hail lies in an area extending from Texas to Canada east of the Continental Divide.

There seems to be little hope in predicting the presence of hail along a flight path. Hail is a part of thunderstorms and, the two scientists reported, it is believed by some that hail is necessary to the formation of a thunderstorm. Therefore, for the present, the pilot must depend on his experience and on advice from airline meteorologists in order to avoid damaging hail. In the future, radar techniques may be developed so he can recognize, in his cockpit, hailstorms which he must avoid.

Science News Letter, June 2, 1951

INVENTION

Alloys of Titanium Have Valuable Properties

➤ WIDER USE of the metal titanium in structural work is promised with an alloy possessing strength, ductility, hardness and elastic properties on which a patent was issued by the government. It contains 90% titanium. The other metals are aluminum and molybdenum in varying proportions.

Titanium ore is very plentiful. Compounds of this metal are in wide usage, particularly the oxide used as a white pigment in paint. In recent years, commercial methods of obtaining the metal itself from its ores have been developed and titanium is becoming more common. It has many practical applications but for some structural purposes needs additional strength and ductility.

Patent 2,554,031 was issued to Robert I. Jaffee and Horace R. Ogden, both of Columbus, Ohio, for this alloy. Remington Arms Company, Inc., Bridgeport, Conn., has acquired the patent rights.

Science News Letter, June 2, 1951

TECHNOLOGY

Sugar Beet Molasses Yields Synthetic Rubber Chemical

➤ SUGAR BEET molasses can be changed to yield up one of the chemicals from which synthetic rubber is made. The method uses micro-organisms, tiny life forms. These ferment the molasses, changing its chemical structure in somewhat the same way yeast ferments grain mashes to give alcohol.

Butanediol is the chemical into which beet molasses, a cheap and plentiful agricultural by-product, is changed. The process, a continuous one, has been tried successfully on a factory-model basis. Butanediol is a source material for butadiene, base substance for the manufacture of several synthetic rubbers.

By the new fermentation method, 1,000 pounds of molasses yields about 177 pounds of butanediol, 41 pounds of ethyl alcohol, and 7 pounds of acetoin, a chemical used in the preparation of flavors and essence.

An input capacity of 60,000 pounds of molasses per day could be handled by a full-scale plant, the National Research Council of Canada in Ottawa estimates. The process was developed by the Council's division of applied biology.

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