

Spiders

➤ ONE sign of authentic Navajo weaving, it is said, is a hole left in the middle of the blanket or basket. This is in compliance with an ancient compact with the Spider Woman who imposed this condition in return for teaching the Pueblo Indians of the Southwest the arts of spinning.

The ancient Greeks paid tribute to spiders with a legend of their own. A maiden named Arachne was so skillful at the domestic art that she challenged the goddess of weaving, Athena, to a competition. Her handiwork was so excellent that the goddess, in a rage, destroyed the tapestry of her mortal rival, changed Arachne into a spider, and condemned her to an eternity of spinning. Arachne became the Greek word for spider, and scientists still preserve the word in their name, the Arachnids, for the class of creatures to which spiders belong along with scorpions, mites, ticks, and Daddy Longlegs.

People frequently make the mistake—usually accompanied with an “ugh” of revulsion—of grouping spiders with the insects. Spiders are not insects. Insects form a separate class of their own. The spider clan differs in many ways, possibly the most striking being the fact that they have eight legs.

Another interesting difference between spiders and insects is that spiders lack wings. But this lack of “conventional” fly-

ing equipment is no serious handicap, because spiders have evolved a method of airborne travel that is as giddy as a roller coaster and as improbable as a magic carpet. It is called ballooning.

Ballooning is an activity which seems to be characteristic of new-born spiders, but it is by no means restricted to them. Provided the spider species is small in size, all age and maturity groups seem to indulge in the sport. The way the game is played is this: A spider will make for the highest available point, for example the pinnacle of a stalk of grass. Then it will face into the wind, pointing its abdomen at a high angle up into the air.

This position, with the rear end tilted up like a cannon, puts the spinnerets into an advantageous position. Silk thread starts from the spinnerets, the passing breeze tugs on the silk, pulling it out. As the thread grows longer, the tug grows stronger, and at a certain point the spider lets go its toe-hold and goes sailing off downwind on its silken filament.

This unlikely aeronautical technique probably accounts for the dispersion of spiders all over the globe. Charles Darwin observed ballooning spiders when his ship, the Beagle, was 60 miles off the South American coast, and they have been reported as far as 200 miles offshore.

One of the requirements for ballooning is lightness of weight. The larger spiders, like the tarantula sketched above, are too bulky for ballooning even when young.

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## AERONAUTICS

### Drastic Cut in Red Tape of International Air Travel

➤ RED tape in travelling from country to country by airplane is now drastically cut. The International Civil Aviation Organization, whose central office is in Montreal, Canada, has revealed that the member nations have agreed to proposals of the central 50-nation group.

It means, officials of ICAO state, that the member nations have agreed to a standardization of customs, immigration and related

procedures which will speed the international movement of both passengers and cargo by air.

ICAO's regulations provide for standardized forms for the entry and clearance of aircraft, crews, passengers and cargo. Among these forms is the embarkation-disembarkation card which, in many cases, will eliminate in-transit visa requirements for passengers moving through a country to another destination.

The new regulations also provide for the creation of direct transit zones, which will completely eliminate red tape for passengers staying on the same flight or making direct connections.

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## ENGINEERING

### Sisal By-Product Yields Building Blocks of Soil

➤ AN UNUSED portion of the sisal plant remaining after fibers have been removed for rope making is now yielding a material which makes soil into high-quality building blocks.

This is a development in Africa. An English chemical company has announced plans to erect two factories to produce the soil stabilizing agent in Tanganyika and Kenya, two sisal-growing areas. The story is told in CHEMICAL AND ENGINEERING NEWS, published by the American Chemical Society.

Soil blocks, stabilized with the sisal by-product, can be used in construction in the same way as cement or concrete blocks. Weather-proof and wear qualities of the blocks are satisfactory. Building costs can be cut 40% when stabilized soil blocks are used instead of those made with cement.

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### Words in Science—FISSION-FUSION

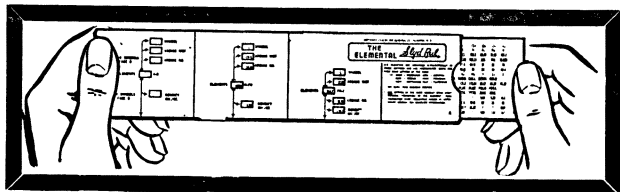
➤ FISSION is defined as the splitting up into parts while fusion means the combining together by heat.

In the atomic bomb process, fission takes place in uranium 235 or plutonium when it is bombarded with neutrons. The atom is split into elements of lesser mass with the conversion of mass into tremendous amounts of energy and deadly radiation that can be so destructive.

In the so-called hydrogen bomb, fusion would take place. That is, triggered by a fission bomb producing extreme temperatures, the light elements would form heavier elements. In the process of this fusion synthesis, mass is also lost and converted into tremendous energy, according to the Einstein mass-energy equivalence.

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