

Scientists unravel spider's web

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HOW the spider weaves its web has baffled textile engineers for years. Now it seems that it could teach electrical and hydraulic engineers a thing or two, according to two Oxford scientists writing in today's issue of the magazine *Nature*.

The spider *Araneus diadematus* spins two types of thread: a stiff one which provides the web with a radial frame; and another encircling variety which is elastic enough to absorb the impact of a flying insect without breaking.

The elastic thread — a thousandth of a millimetre in diameter and capable of contracting to a twentieth of its length without sagging — is made up of two filaments inside a glue-like cylindrical coating that can conduct electricity.

The two authors, Dr Donald T. Edmonds, a physicist,

and Dr Fritz Vollrath, a zoologist, are now investigating whether the spider uses this electrical conductivity.

"In construction it's quite like a power cable," said Dr Edmonds. "You don't want this thread to stick together, so it must have this property of being almost infinitely elastic."

The glue bunches into little balls, into which the dual thread winds to contract; or, to expand, the glue balls lubricate the threads as they unwind. "Some people are now interested in the technological properties," said Dr Edmonds. "It's far, far stronger than Terylene or anything else."

The scientists found that the difference between the stiff thread and the elastic thread was the water content of the gluey coating.

"The clever thing we haven't yet found out is how does the spider, with this magic glue, maintain the water coat?" said Dr Edmonds.