

lead atoms has a cross-section of 2.5 units of atomic cross-section area.

By comparison thorium has a cross-section over twice as large, or 6.0 units.

Finally, uranium with mass 238 (the kind that releases atomic energy) has a cross-section of 1.5 and is thus small by

comparison, so that having neutrons hit uranium atoms and split them is no easy task.

The unit of atomic cross-section used is equal to 10^{-24} square centimeters, or 0.000,000,000,000,000,000,000,001 square centimeters.

Science News Letter, May 11, 1940

CHEMISTRY

Nylon, Rival of Silk, May Soon Compete with Wool

Versatile Synthetic Fiber Enters New Field With Process To Make It Heat-Insulating, Moth-Proof

NYLON, versatile synthetic fiber material which is now entering the fine hosiery field because of its silk-like qualities, may next tackle natural wool as a competitor.

A new patent, issued by the U. S. Patent Office, covers the production and processing of a crimped wool-like fiber made from nylon. The new patent is issued to John Blanchard Miles, Jr., scientist of E. I. du Pont de Nemours and Company, and is assigned to du Pont.

The new wool-like nylon is said to approach, "and may even equal" wool in its heat-insulating properties. Other claims of superiority include strength, heat stability, dyeing characteristics, elasticity, mothproofness and immunity to any harmful action by common cleaning fluids or processes.

E. K. Gladding, manager of the nylon division of du Pont, says there is no immediate commercial production planned for the new wool-like nylon fiber. Such production will require new types of manufacturing equipment, all of which must yet be designed and built.

The patent covers the conversion of filaments from synthetic linear condensation polymers, particularly polyamides, into wool-like fibers by mechanical methods of "crimping" either prior to, during, or following the "cold-drawing" process which is used in making nylon yarn. In general the patent states that at least four crimps to the inch are required to obtain a wool-like material.

The retention of the crimp quality after the stretching that occurs in normal use is improved by hot water or steam setting treatments. The new fiber lends itself to the preparation of mixed fibers and its luster can be controlled in manufacture to improve its appearance.

Nylon is the chemical material which in fine filaments can be made into sheer, strong and water-repellent hosiery which will be on the market May 15. In thicker filaments it is being used for fish lines and leaders, and coarse bristles of nylon are appearing in toothbrushes. The application to a crimped wool-like fiber is the newest achievement of this versatile chemical material.

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ASTRONOMY

New Theory Shows Moon Once Part of South America

THOUSANDS of small glassy objects, called "tektites," discovered on the southwestern shores of the Pacific Ocean are important evidence that the moon was once a part of the earth, according to a theory advanced by Dr. Carl W. Rufus, of the University of Michigan astronomy department.

These tektites have been studied by scientists for more than 150 years, but there has never been a satisfactory theory for their origin.

Dr. Rufus' explanation of the phenomena is based largely upon the general "fission" theory of the origin of the moon, developed by Sir George Darwin,

and which says that the Pacific Ocean is a scar on the earth—created when the moon was torn away 10,000 years ago by a powerful tidal force.

Some of the loose matter which was pulled away with the moon did not fall back immediately to earth, Dr. Rufus says, but rather continued to revolve out in space for some time. These particles, he believes, were similar in composition to the matter which is contained in Saturn's rings today, and are the same glassy "tektites" found in the Pacific area.

The composition of the primitive earth at the time of the moon's fission is not known today, but it is generally believed that the rupture occurred while the earth was beginning to solidify. According to Dr. Rufus' explanation, the earth was made up of an upper layer of hard granite with a lower layer of glassy basalt beneath the granite.

"When the fission occurred," the astronomer continues, "it seems very probable that the mass of the moon stripped the Pacific area of its granite layer and probably lifted some of the material from the glassy layer. The glassy part being deepest, it was the last to leave the earth and would therefore constitute the material which formed the detached fragments."

These particles were drawn into the earth's atmosphere at "speeds sufficient to produce the typical forms which are characteristic of tektites today."

Further evidence to support Dr. Rufus' contention is the series of large trenches on the floor of the Pacific Ocean, parallel to the area in which the tektites are found. These trenches are thought to extend deep into the glassy area.

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CONSERVATION

Trumpeter Swans Saved From Threatened Doom

See Front Cover

GRACEFUL white swans, that glide through many a popular song, almost lost one of their most beautiful native American species a few years ago. The trumpeter swan, once down to a doubtful score or so of birds, responded to the 1939 census with 199 specimens, with every hope of further increase. The bird shown on the front cover was photographed by a member of the U. S. Biological Survey on the Red Rocks Migratory Waterfowl Refuge in Montana. The entire trumpeter swan population of the world is concentrated there and in Yellowstone National Park.

Science News Letter, May 11, 1940