

frostbitten and both hands "suffered severely from the cold" while he was making his observations, Dr. Walker was not satisfied with his technic and states that the work was not done "with sufficient accuracy to claim the establishment of any new facts."

He did establish a record, however, for the highest altitude at which such tests had ever been made. The previous record for high altitude "germ" searches was 20,600 feet, established by Prof. B. E. Proctor of Massachusetts Institute of Technology. Others who have examined the upper air for the presence of disease germs or of fungi are F. C. Meier of the U. S. Department of Agriculture and Col. Charles A. Lindbergh who assisted Mr. Meier by exposing plates to catch possible fungus spores in a recent flight over land and water.

Dr. Walker made his flight in a new

U. S. Army bombing plane. The doctor sat in the compartment provided for the machine gunner at the farthest forward point of the plane. There was a slit in the front through which he could extend his hands.

At 20,000 feet, and at every 1,000 feet above to 28,000, Dr. Walker held his hands through this slit to open a sterile flat glass dish containing solidified material on which "germs" grow. In spite of the intense cold—34 degrees below zero Fahrenheit—and wind that rushed past at a velocity of 150 miles an hour, he managed to hold the dishes open for half a minute. The dishes or plates were then brought back to his laboratory and incubated. On only two of twelve plates were there any microorganisms and these, Dr. Walker is sure, were contaminated by organisms on his hands or clothing.

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INDUSTRIAL RESEARCH

Textile Research Pays Million Dollars Annually

DRAMATIC answer to the oft-mentioned question "Does fundamental research in industry pay?" was offered at the dinner of the U. S. Institute for Textile Research.

The estimated financial return from research investment of a few hundred thousand dollars spread over five years' time is \$1,000,000 a year.

Even if the \$1,000,000 saving was gained but once, the research would be good business; but the saving would be an annual one, if textile mills utilized generally the research results obtained.

Dr. E. R. Schwarz, associate professor of textile research at the Massachusetts Institute of Technology, headed the symposium which revealed the "\$1,000,000-a-year" textile research. Toastmaster at the dinner was Francis P. Garvan, president of the Textile Institute and president of the Chemical Foundation.

One new textile aid, C. L. Pattee of Salem, Mass., revealed, is the use of microscopes for studying the weakness and dyeing qualities of cotton fibers.

Shine polarized light on a cotton fiber, examine it with an inexpensive low-power microscope, and the mature and immature fibers stand out from one another. Mature fibers bring strength into the cotton threads into which they are made; immature fibers are weak and will not take dyes well or uniformly.

Formerly workmen known as cotton classers went through each bale of cotton and tried—with only partial success—to recognize and sort the young from the old cotton. Considerable waste in the form of weak yarn and poor dyeing resulted.

With the easily-learned microscope-polarized-light technique, an unskilled operator now excels the most skilled cotton classers.

Study of the size of silk fibers has removed one bugbear from silk fabrics manufacturers—two-toned dyeing—where adjacent sections of the fabric come out of the dye vats in different hues, although the same dye was used.

F. A. Mennerich, of Hoboken, N. J., disclosed that a difference in silk fiber size amounting to but three hundredths of an inch in diameter ratio was sufficient to cause the two-tone dyeing.

Flatter and larger silk filaments dye darker than the rounder and smaller filaments. Previously it had been supposed that conditions of soaking, dyeing and boiling-off the dye were the basic causes of the trouble.

The size of the silk filament is not especially important in determining a shade of silk stockings, for example. What is needed is uniformity of size within the .03 inch diameter limits.

The new technique is to grade various

bales of silk as to filament size and then see that no two consecutive bales have silk filaments varying by more than the known limits. This practice is found to eliminate two-tone dyeing from about two-thirds of all lots of silk without further help.

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PHYSIOLOGY—METEOROLOGY

Forest Service Lookout Tells How Lightning Feels

U. S. FOREST Service men certainly can "take it": one of them was struck by lightning not long ago, and lives to tell the tale.

Al Moore was on lookout duty on top of a hundred-foot steel tower, set high on Quartz Ridge, in the Nezperce National Forest. A black storm rolled up. His steel perch was a challenge to the thunderbolts, bolder even than Ajax. And the lightning did not ignore the challenge. It hit that tower, Al Moore and all, a first-class stroke.

Said Lookout Moore afterwards: "My first impression was a blinding flash, but I was not aware of any crash or noise. A hit like that leaves a man with a very limp, weak feeling, soon followed by a cold sweat and an empty sensation in the pit of his stomach."

And with professional coolness he commented, "There is some satisfaction in knowing that the tower can take a direct hit and the lookout live through it."

Even without a direct hit, a steel lookout tower is an interesting place during lightning weather, as Mr. Moore describes it: "The tower always buzzes and hums as a storm approaches, and small balls of blue flame hang to each corner of the cabin roof . . . It's good business to wear rubber-soled shoes, and to keep hands off sides of the cabin and other metal parts."

At that, for all his steadiness and nerve, Mr. Moore admitted that for days after the experience the mere recollection of it would "raise goose-pimples" all over him.

A steel tower 100 feet tall, rising high above any treetop or rock in its immediate vicinity, is a target for lightning hardly to be improved upon. That a Forest Service man stays in it, storm or no storm, watching for the first pencil of smoke a lightning-set forest fire may send up, miles away, even after the literally hair-raising experience of Lookout Moore went through, is surely testimony to the nerve and loyalty to the job to be found in the Service.

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