



OPEN BOLL—Bursting like popcorn from its brown boll, the lint is what gives a snowy appearance to the cotton field. If it were tinted, we might have rainbow fields.

fibers. Cotton dresses and shirts are made to look fresh and clean by chemical bleaching between the time the cloth leaves the weaving loom and reaches market.

Every fiber of cotton is produced by the outgrowth of a single epidermal cell. The number of fibers arising from the outer layer of one seed is estimated to be between 10,000 and 20,000. Although commonly referred to as "fibers," they are quite different in origin and structure from the long-bast fibers which are extracted from the stems of flax, hemp, jute and many other plants.

Some of the epidermal cells of the seed start to elongate on the day that the flower blooms. Others can be found in the initial stage of fiber development as late as 10 to 12 days from the date of blooming. At the end of 20 to 25 days the fiber has reached its full length.

The walls of the fiber thicken throughout the entire period of fiber growth, but it does not become marked until after the 20th day. The wall is thickened by materials produced in the living protoplasm of the fiber. They are deposited in successive layers upon the inner surface of the fiber walls and are responsible for its strength and flexibility.

Commercial cotton fibers vary in length from three-quarters of an inch to two inches, but most of the cotton grown in this country averages about an

inch in fiber length. The length ranges from 1000 to 3000 times the diameter of the fiber, the average diameter being about $1/1310$ inch.

There are 90,000,000 individual fibers in an average pound of cotton. Thus if the fibers were laid end to end, they would reach from Memphis to St. Paul, or from New York to Chicago.

Cotton is recognized as the world's most important fiber. For the quarter-century preceding the war, each citizen of the United States used approximately 26 pounds of lint cotton each year. Enough cotton is consumed in the United States each year to make a bolt of cloth 6,800,000 miles long. But the chances are that little if any of that cloth will be made of natural-colored fibers—at least for many years to come.

Science News Letter, July 8, 1944

If you would like to have samples of brown and green cotton, as well as a cotton boll, to experiment with and show your friends, you can secure the Cotton Unit of THINGS of science, a kit prepared by Science Service, by sending 50 cents to SCIENCE NEWS LETTER, 1719 N Street, N. W., Washington 6, D. C., and asking for Things unit No. 44.

Langbeinite, a rare potash-magnesia mineral used as a source of fertilizers, is found only in five countries—the United States, India, Germany, Austria and Poland.

BIOGRAPHY

Dr. C. G. Abbot Resigns As Smithsonian Secretary

➤ RESIGNATION of Dr. Charles G. Abbot as secretary of the Smithsonian Institution, effective July 1, has been announced. Dr. Abbot, who is now 72 years of age, joined the Smithsonian staff in 1895, and has been its chief administrative officer since 1928.

Although giving up heavy executive responsibility, the retiring secretary is not severing his connection with the Institution. He will retain a staff position as research associate, which will enable him to devote more time to certain investigations which he has had in hand for some years.

Dr. Abbot's entire research career has been devoted to the study of physical conditions on the sun. In recent years he has paid particular attention to the correlation between fluctuations in solar radiation and changes in weather on the earth. He has also developed apparatus for the direct utilization of solar energy in the production of usable forms of power and heat.

Dr. Abbot is a trustee of Science Service.

Until a new secretary is chosen by the Smithsonian Institution board of regents, Dr. Alexander Wetmore will serve as acting secretary.

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CHEMISTRY

Toluene May Be Made From Fractions of Petroleum

➤ TOLUENE, basic material for TNT (which in chemical longhand is tri-nitro-toluene) can be made synthetically from two cheap, abundant substances found in oil and natural gas, by a new process on which U. S. patent 2,352,199 has just been issued to Prof. Vladimir N. Ipatieff and George S. Monroe, both of Chicago.

The substances are benzene, which is one of the common light fractions of petroleum, and methane, simplest of the hydrocarbon gases, which is one of the chief constituents of most natural gases and is also produced in quantity in certain petroleum-cracking processes.

In the Ipatieff-Monroe synthesis, benzene and methane are subjected to high pressure, between 50 and 450 atmospheres, at a temperature of from 350 to 750 degrees Centigrade, in the presence of a catalyst. With the toluene, diphenyl is also synthesized; this co-product has a number of industrial uses.

Science News Letter, July 8, 1944