

## SCIENCE NEWS

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## THE CITRUS FAMILY

THE citrus family has had its pedigree revised and brought up to date by a veteran Department of Agriculture botanist, Dr. Walter T. Swingle. Results of his studies, which are expected to be of considerable use to breeders developing new hybrids and to orchardists seeking hardier stocks for grafting, will be published soon in monograph form by the University of California Press, as part of a series of major scientific publications in celebration of the seventy-fifth anniversary of the founding of the university. Dr. Swingle's monograph constitutes the first complete reexamination of the citrus family tree since 1824.

Under the new arrangement, the family consists of 33 genera, only one of which, the genus *Citrus* itself, is extensively cultivated for its wide variety of edible fruits. However, any one of the 32 other Cinderella sisters in the group might, if managed correctly, assist in producing valuable new hybrids, or offer hardy roots on which present varieties of citrus fruits may be grafted. Furthermore, though these others do not at present produce edible fruits, some of them have good possibilities as ornamentals.

In working out the relationships of the many species in the family, Dr. Swingle made use of a radical new method of study. Ordinarily, a botanist studying pressed herbarium specimens examines the dried flowers whole, usually after picking one off and soaking it in water. This inevitably destroys a piece of the specimen; and often when there is only one specimen to be had, the herbarium curators are reluctant to let it go for this purpose.

Dr. Swingle, using a procedure pioneered in World War I days by a noted Swedish botanist at Upsala, embedded single flowers or buds in paraffin and sliced them into transparently thin specimens for examination under the microscope. One specimen was thus multiplied into scores. The method also made possible far more accurate and critical examination of anatomical details than was possible under the older procedure.

Since 1935, when he began his work on the reclassification of the citrus family, Dr. Swingle has accumulated more than a quarter-million such microscope-slide specimens, each keyed to connect it up with the original pressed plant on a herbarium sheet somewhere in one of the world's great museums or universities. The whole quarter million can, if necessary, be packed in a box of only three cubic feet capacity.

The citrus family has a curious geographic distribution. Its principal area stretches from Indomalaysia southeastward as far as Fiji. There are also a number of genera in Africa; none elsewhere in the Old World, and none at all in the Western Hemisphere.

## TUNISIA

As Tunisian rainy season for early 1943 draws to a close, combat activities become possible in the semi-desert areas south and west of the seaport city, Sfax. January

is usually the wettest month in this westernmost of French possessions in North Africa. Its rainy season is roughly from October to April. The other months are hot and dry—usually with little or no rainfall.

Southern Tunisia has little rain at any season. It is a desert area. Northern Tunisia is mountainous except for a flat coastal rim. The United Nations' fighting forces are in the mountainous country, the Axis on the coastal rim. American forces are reported to be in the northern part of middle Tunisia, the area stretching northward from the semi-desert country along the great salt-depression called Chott el Djerid, the largest of the salt-water lakes or chotts of Tunisia.

In the mountainous area are farms, grazing ranches, and timbered areas with growths of marketable evergreen oaks, Aleppo pines and cork trees. The olive groves for which Tunisia is famed are on the coastal rim from Sfax, which is to the northeast of the Chott el Djerid, northward to Tunis.

Mountainous middle and northern Tunisia is not an easy country for troop movements. It is a land of mountains and plains but without plateaus. It is rough and badly eroded in some sections. It is not supplied with good roads. Getting about in the rainy season is a mud-fighting job. But with new military roads constructed by the Army and with additional flying fields, the path is cleared to drive the enemy on the coastal plains into the Mediterranean.

It is a difficult country in which to obtain food and fighting equipment for an army. Considerable quantities of wheat and barley are produced, some of which are exported normally but not enough to be of much help in feeding the United Nations' troops. It produces many goats, considerable numbers of sheep, and some cattle. Goat meat is not included in the American army diet, and enough local mutton and beef can not be purchased to meet the needs.

Supplies of all kinds must be transported over a long and difficult road. They are brought by ships to Casablanca, and from there by standard-gauge railroad to western Tunisia. Then they must be reloaded onto narrow-gauge cars or army trucks for transportation to middle Tunisia. They are carried by railroad and highway a distance equal to half the distance from Washington, D. C., to Los Angeles. Some supplies and equipment are unloaded from shipboard at Algiers. Transportation from there is over the same standard-gauge and narrow-gauge railroads.

Shortage of railroads and highways in Tunisia is due to the easy water transportation of the country. It has the Mediterranean on the north and on all of the productive east. It has many good harbors for medium-sized ships and one at Bizerte for the largest ships. But these ports are not yet available for the United Nations.

The small population of Tunisia and the rather simple life of the inland inhabitants have not required the transportation facilities necessary in certain other countries

where the people are more interdependent upon each other. Approximately three million inhabitants include about 2,400,000 natives, Berbers in the northern part and Arabs in the south. The 110,000 persons of French blood are largely in the north, as are also the 94,000 persons of Italian blood. There are many Negroes and mulattoes, and a so-called Moorish population. This is a mixture of all the races that have successively settled in Tunisia.

### DISCOVERY OF RUBBER IN DECAYED BARK

CHANCE discovery of threads of good rubber in a bit of rotting bark in a Haitian forest may eventually mean restoration to favor of the Castilla rubber tree, once a prime source of the bouncy gum but displaced by Hevea because the latter could be tapped more successfully. That we can develop a method for mincing up Castilla bark and getting the bits of rubber out whole, as is now done with the guayule shrub, this disregarded tree may again become a practicable commercial source, is suggested by Dr. O. F. Cook, of the U. S. Department of Agriculture.

Hevea displaced Castilla as a plantation tree because it can be milked every day, whereas the latter tree yields copiously on the first tapping but after that "dries up" and gives no more latex. Harvesting Castilla rubber in the wild, therefore, resolved itself into a very destructive affair. The trees were cut down, the trunk and larger limbs ringed with cuts, and all the latex thus extracted at once. The dead trees were left to lie where they fell. If it proves possible to make an economic extraction of rubber from the bark, after taking the latex by the conventional tapping, the yield of Castilla may be increased to a point of economic justification.

There appears to be an enzyme in Castilla sap, which destroys the rubber if it has a chance to act on it. Dr. Cook suggests that this enzyme could be destroyed by heating, merely by building a light brush fire around the felled trees while they are still green. Then the bark could be stripped and processed whenever convenient.

### WINTER FOOD OF GAME BIRDS

WEED seeds are turned into meat by game birds; they form the chief winter food of several species, according to studies by Philip S. Baumgras, of the Michigan Department of Conservation. Mr. Baumgras's report will be printed in full in the *Journal of Wildlife Management*.

That bane of hayfever sufferers, low ragweed, turns out to have some use after all. It yields the biggest supply of winter feed for the birds, as indicated not only by a study of pheasant crop contents, but by careful hand harvesting and weighing of ragweed seed from a number of typical Midwestern field environments. Wheat stubble fields were an especially rich source, yielding an average of 205 pounds an acre in October. Other weed seed serving as winter food for wildlife species include foxtail grass, lambsquarters, black bindweed, smartweed, barnyard grass, finger grass and pigweed.

Wild birds and small game animals are good gleaners of grain left in the field after harvest. In the fields studied by Mr. Baumgras there was an average of nearly seven bushels of corn left unpicked by the mechanical har-

vester. Most of this was salvaged by livestock; the remainder was used by wildlife. Pheasants especially like corn, though it is not always the best food for them. Squirrels go after it, too, especially when the crop of acorns and beechnuts is short.

Wheat fields cut with a tractor-drawn binder yielded nearly two and a half bushels of waste grain per acre, and oat fields a bushel more than that. This scattered grain was picked up mainly by starlings and blackbirds, but to some extent by pheasants and ducks.

### ITEMS

HOPE for a raw-egg-white cure of cancer should not soar too high on the basis of New York research reported from Chicago. Future publications are sure to give the negative side of this line of attack. The method is being studied in several scientific institutions which will report their findings as soon as sufficient studies have been made to warrant drawing conclusions. The raw-egg-white treatment is based on the theory that, since a high content of the vitamin chemical, biotin, has been found in cancer tissues, treatment with raw egg white should be beneficial because raw egg white contains an anti-biotin chemical, avidin. The raw egg white, according to this theory, would destroy the biotin believed by some to be necessary to the life of the cancer. Biotin, according to previously published reports, favors the development of one kind of liver cancer in rats. Its exact role in human cancer has not yet been determined. Efforts to reduce the amount of biotin in the human body by means of raw egg white are not without danger. A vitamin hunger disease, technically termed biotin deficiency, with symptoms strikingly like those of vitamin hunger diseases due to vitamin lack from poor diet, has been produced in humans by large doses of egg whites.

THE U. S. Department of Agriculture, which produced sheer cotton hose when silk grew scarce, is now experimenting with substitutes for sheer cotton. At the experimental hosiery mill at Beltsville, Md., government technicians are trying to make elastic, durable hose from medium-length fibers, now that most of the long-staple cotton is needed for parachute harnesses, airplane cloth and other war fabrics. Most of the cotton mesh or ribbed hose now being sold are made of fine two-ply yarn from long-staple fibers. They are also original government designs or adaptations of them. Present research aims to increase the strength and elasticity of single-ply yarn by means of high twist and chemical finishes. The results may not be so sheer, but they will be practical.

IN Crawford County, Ark., where spinach growing is a really big-time industry, some 13,000 acres were planted very early last fall, in hopes of getting an extra cutting early in the season. What happened instead was a terrific epidemic of a fungus disease, downy mildew, which took from a third to a half of the first cutting. According to Dr. Seth Barton Locke, of the Arkansas Agricultural Experiment Station, the too-early planting gave the fungus its chance. The epidemic died down by mid-December, but dead leaves around the bases of the plants were found to be carrying an abundance of spores, ready to start mischief again when the weather warms up.