

of meats and vegetables rich in the vitamins which bread at present lacks. Or they can, on their doctor's advice, take vitamin chemicals in the form of pills.

For poor people, however, bread and cereals must be the mainstay of the diet for economic reasons. As for vitamin pills—it would cost nearly \$5.00 to buy at present drug store prices the amount of thiamin alone which can be had in enriched flour for less than 50 cents a barrel extra, and this extra 50 cents also pays for the nicotinic acid and iron that will be in the enriched flour.

As soon as enriched flour and bread become available, bakers and consumers will be urged by those guiding the nation's nutrition program to prefer this scientifically constructed loaf to formulas for bread which fail to provide all the nutritional elements called for in the specifications of the new flour.

Thiamin, nicotinic acid and iron are "musts" for the new, enriched bread and flour. Scientists recognize, however, that adding these three chemicals to bread is not the entire answer to the restoring of bread to its ancient estate as the staff of life. The coarse dark breads our grandfathers ate represented about 85% of the contents of the wheat berry. Our modern white flour represents only from 60 to 70%. Lost with this 30% to 40% of the wheat berry are not only thiamin, nicotinic acid and iron, but other members of the vitamin B complex.

Among these are riboflavin, pantothenic acid, vitamin B₆ and many others which have only recently been discovered. As these become available chemically, as thiamin and nicotinic acid now are, they will be added to enriched flour in the amounts considered desirable for the nation's welfare.

National defense needs have speeded the bread and flour revolution to a much earlier start than was expected. Millers had been developing this program, but were waiting for the U. S. Food and Drug Administration to announce a name and standards or definition, for the new flour. That announcement is anticipated in the very near future.

Meanwhile, the Nutrition Planning and Policy Committee of the federal government which is functioning in the national nutrition program with the advice of the National Research Council's committee on food and nutrition, has recognized the need for early action because of the emergency.

There is much reason to believe that a population receiving enough vitamins in its food is better able to withstand the stresses and strains of war and threats of war. This committee has urged the millers to start immediately making a flour which, as it becomes available, will provide an increase in vitamin consumption the country over. And the millers are moving full speed ahead.

Science News Letter, February 8, 1941

RADIO

Television Broadcasting Not Limited to Wealthy

"TELEVISION broadcasting is by no means limited to those with millions to invest," Allen B. Du Mont, president of the Du Mont Laboratories, said in a statement on the present status of television.

"It is the writer's honest opinion," he declared, "that a good start in television broadcasting can be made for as little as \$25,000. And that figure can even be shaved if need be. For that sum one can obtain a 50-watt video and audio transmitting setup, which will prove adequate for the average city coverage. The transmitting aerial will have to be at least 250 feet high for satisfactory coverage of the desired area. The film pickup, camera and associated equipment will round out the requirements."

"At this early date almost any kind of program material will prove adequate. Just as the local weekly paper has a place in the community, despite the overwhelming bulk and appeal of the big metropolitan daily, so the local television station can find a place despite the millions that may be talked about for big metropolitan enterprises."

Defense demands are temporarily slowing the development of television, thinks Mr. Du Mont.

"The greatest progress in any one year was scored in this video form of broadcasting during the past twelve months," he stated. "And, were it not for the tremendous demands of our national defense emergency which must be necessarily first in importance over all other activities in the laboratory, factory and transmitting station, television might well be on its commercial way this year."

Science News Letter, February 8, 1941

PSYCHOLOGY

Uncle Sam Trains Girls To Make Shell Fuses

THE DEXTROUS fingers of girls are now being trained at Newton, Mass., by Uncle Sam for the delicate precision work of making time shell fuses.

Unique among the programs for training men for defense jobs is this WPA training course, the only one where women are being fitted for the defense industries. All those taking training at Newton are girls, and they have proved to be more adaptable than men at learning this particular kind of work.

Nearby watch factories, including the



DEFENSE TRAINING

An instructor explains the mysteries of a lathe to one of the students in the WPA training course at Newton, Mass.

Waltham Watch Company, are working on defense orders for instruments such as the girls are learning to make. The women in this project have already demonstrated that they possess hand and finger dexterity needed for this precision work.

The trainees are taught to operate light lathes, watch lathes, bench engine lathes,

kick presses, punch presses and eyelet and riveting machines. They also receive instruction in spot welding.

The program was initiated by the Newton Public School system, as part of the national WPA Vocational Training Program.

Science News Letter, February 8, 1941

ARCHAEOLOGY

Magnificent Art Gallery Created by Cavemen of France

Discovery Originally Made by Five Schoolboys Near Montignac Is Confirmed By Abbe Henri Breuil

DISCOVERY in unoccupied France of a "magnificent" 30,000 year old gallery of prehistoric cave-man art, rich in pagan human figures, enormous bulls, horses and one black rhinoceros, is stirring scientific circles in the United States.

The world-famous authority, Abbe Henri Breuil, has succeeded in reporting to the British science journal, *Nature*, (Dec. 21) his authentication of the art discovery near the little town of Montignac in southwestern France.

Five schoolboys were the real discoverers of Lescaux cave, which will take its place in prehistoric annals alongside the "Sistine Chapel of Magdalenian art" in Altamira cave, in Spain. The new-found gallery of European art is pronounced far more ancient than the Altamira paintings, which are rated about 20,000 years old. Lescaux cave was decorated in closing days of the Aurignacian era of the Old Stone Age, a stage of culture which archaeologists have begun to distinguish by the still rather unfamiliar name of the Perigordian epoch.

Enormous bulls nearly 16 feet long, drawn in wide black lines with big spots sprinkled on the beasts' heads, impressed the Abbe Breuil, as he became first expert critic to appraise the ancient masterpieces. In one area of the dark underground passages and galleries, he counted more than 80 pictures, chiefly done on blocks that have fallen from the vault above. Some ascending galleries of the cave are still almost entirely unexplored.

The artists who worked by torchlight in the cave, painted horses with red color, giving them heavy coats in softly dappled pattern. Other animals portrayed, probably with magic rites as an aid in hunting, include oxen, bison, stags, two

lions, and one questionable bear figure.

Describing a striking scene, suggesting prehistoric European drama, the Abbe Breuil reports:

"To the left a black rhinoceros walks slowly away; in the center, drawn in red, a half-conventionalized man is lying beside a javelin and a throwing stick. To the right, a sand-colored bison outlined in black gazes at him; its entrails seem to be flowing out like a horse ripped open in a bull-fight."

In peaceful contrast: near the man a bird is perched on a post.

Foreseeing many surprises in store when the art can be further studied, the French prehistorian says that the pictures show signs of different techniques with frequent painting over the same space and frequent attempts at restoration.

Signs, such as chessboard patterns, resembling coats of arms, and pronged, comb-shaped patterns, and barred rectangles are numerous among the pictures.

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PLANT PHYSIOLOGY

One-Celled Plants Stimulated by Ultraviolet

ULTRAVIOLET radiation, usually considered inimical to life, proves a stimulant to reproduction in primitive one-celled green water plants when applied in less than lethal doses, experiments by Mrs. Florence Meier Chase, Smithsonian Institution biologist, have demonstrated.

Ultraviolet rays of certain specific wavelengths are now widely used in hospitals and elsewhere to rid the air of bacteria. Earlier researches by Mrs. Chase showed that the invisible rays

had similarly deadly effect on her primitive green plant cells. But when the same kind of plants are exposed to the same ultraviolet wavelengths for about two-thirds of the time necessary to kill them, instead of dying they multiply at greatly increased rates.

Increased reproduction rates differed according to specific wavelengths, Mrs. Chase found. She found four wavelengths biologically effective: 2352, 2483, 2652 and 2967 Angstrom units, respectively. Each of these wavelengths increased the cell-division rate in a quite definite ratio.

Green cells exposed to the stimulating dose of the 2352-Angstrom rays multiplied 4.7 times faster than a control culture of unirradiated cells of the same kind. The 2483-Angstrom wavelength stimulated cell multiplication to 3.9 times the normal rate, and the 2652-Angstrom wavelength rays produced a stimulation to 4.65 times normal. Least stimulation was brought about by the longest (2967-Angstrom) wavelength: 1.62 times normal.

Although the green cells increased their numbers thus rapidly under the influence of ultraviolet radiation, the size of the individual cells in the stimulated cultures became much smaller than normal, as if the cells could not take time to grow up before they were hurried into reproduction.

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ENTOMOLOGY

Bees Have No Rulers, Yet Their Society Is Not Anarchy

See Front Cover

SPRING'S first hints, bringing earliest tree buds to swelling, tempts venturesome bees out of doors to see what's going on. Already, on warm days, they are dragging out of the hives the bodies of their luckless companions who have not survived the winter, and dumping them unceremoniously to the ground beneath. Bees, often pointed to as the ultimate in the socialist state, certainly are complete utilitarians and apparently have no sentiments of any kind.

The life of the bee colony is ably described and beautifully pictured in a new book by Edwin Way Teale, *The Golden Throng* (Reviewed, SNL, this issue). Every bee in the hive knows its job and does it, without needing to be told or compelled to do so. It goes through a definite round of duties according to its age: nursemaid, home worker, forager afield—again with no authority other than its own instincts to