resulting falsifications of fact which children soon detect, and thereafter become hardboiled little skeptics. Stricter adherence to factual truth, he declared, will have better permanent results in the end.

Science News Letter, September 23, 1944

Ducks Have Malaria

➤ DUCKS sick with malaria of the type that attacks birds showed symptoms of the same kind that are found in seriously ill human malaria patients, a motion picture film displayed before the meeting by Dr. D. E. Fletcher and Dr. R. H. Rigdon, of the University of Arkansas School of Medicine, demonstrated. They could not stand or walk straight, the muscles were weak and incoordinated, and the birds showed little inclination to move. In general, the symptoms were those of injury to the forebrain.

On dissecting the brain after death, such brain injury was found. Certain important nerve cells were greatly impaired, or had even vanished. Similar injuries have been found in the brain of a child that had died of the most severe form of malaria, and also of monkeys experimentally inoculated with malaria.

Science News Letter, September 23, 1944

NUTRITION

Higher Vitamin Content

Vegetables, fruits, cereal foods, and even meat can be made richer in vitamins if nutritionists say the word and point the way to scientists.

➤ VEGETABLES, fruits, cereal foods, such as wheat for bread, and even meat can be made richer in vitamins and other nourishing qualities if nutritionists say the word and point the way to agricultural scientists, Dr. R. J. Garber, director of the U. S. Department of Agriculture's Regional Pasture Research Laboratory at State College, Pa., told members of the American Association for the Advancement of Science, meeting in Cleveland.

Already a way has been found to breed sweet potatoes with a higher content of carotene, the chemical from which human bodies make vitamin A. A variety of snap beans and two varieties of cabbage with more vitamin C in them than commercial varieties of these vegetables have been developed.

Discovery of differences in the amount of thiamin, better known as vitamin B_1, between varieties of wheat suggests, Dr. Garber said, that it may be possible by breeding to produce a wheat with more of this vitamin than any now commonly grown.

It may even be possible, he said, to change by breeding the relative thiamin content of different parts of the wheat kernel. This means that fine white flour for bread could be obtained without milling out the vitamin and having to put it back into the flour or bread as is done under the present enrichment program. Minerals, such as iron, copper, calcium and the like, can be increased in plant foods by increasing the amounts of these minerals in the soil. Some plants, however, may inherit better ability to pick up minerals from the soil than others. This suggests that the plant breeder might develop varieties of plant foods that would supply more minerals as well as more vitamins.

Only a beginning has been made along these lines, Dr. Garber said, but the way is open for great future progress similar to the strides plant breeders have already made in developing fruits, vegetables and grains that are bigger, more attractive looking, better tasting, more productive and more resistant to disease.

Science News Letter, September 23, 1944

Incubator Plants

➤ INCUBATOR babies now have their equivalents in the plant world, it was disclosed at the meeting by Dr. Albert F. Blakeslee of the Smith College genetics experiment station. They are tiny plant embryos, too feeble to sprout from the seeds in which they are formed, or even to produce their own roots when they are helped out artifically, but scientifically so valuable that special efforts to make them live and grow are worth while.

Very carefully dissected out of the seeds with keen but delicate instruments manipulated under a microscope, the minute plantlets are lifted onto a bed of gelatine-like material containing necessary nutrients and carefully kept free of disease germs and fungi. Some of the little plants are too weak to produce roots even with this ultra-careful nursing. For such, a second operation has been provided: micrografting, which supplies roots from a healthy plant that will take hold of the feeble scions and feed them into normal growth.

Drying out is another danger which these botanical incubator babies must face. To prevent this, the weak but hopeful infants are kept inside ordinary gelatine medical capsules, that serve as microgreenhouses.

Naturally, extreme care of this kind is provided only for a few premature infant plants. Thus far, they have been of hybrids produced by crossing plants rath-

SCIENCE NEWS LETTER

Vol. 46 **SEPTEMBER 23, 1944** *No. 13*

The weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St., N. W., Washington 6, D. C. NOrth 2255. Edited by WATSON DAVIS.

Subscriptions—$5.00 a year; two years, $8.00; 15 cents a copy. Back numbers more than six months old, if still available, 25 cents. Monthly Overseas Edition: By first class mail to members of the U. S. armed forces, $1.25 a year. To others outside continental U. S. and Canada by first class mail where letter postage is 3 cents, $1.25; where letter postage is 5 cents, $1.50; by airmail, $1.00 plus 12 times the half-ounce airmail rate from U. S. to destination.

Entered as second class matter at the postoffice at Washington, D. C., under the Act of March 3, 1879. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and in the Engineering Index.

The New York Museum of Science and Industry has elected SCIENCE NEWS LETTER as its official publication to be received by its members.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., PEnnsylvania 6-5566; and 360 N. Michigan Ave., Chicago STAte 4439.

er distantly related, which cannot be induced to form seeds that will be viable by ordinary growing methods, but which give promise of yielding important botanical information if they will only live.

Science News Letter, September 23, 1944

Roots Commit Suicide

➤ ROOTS of plants can poison themselves with the carbon dioxide formed by their own life processes, unless there is some way for this gas to be removed. Dr. H. T. Chang and Prof. W. E. Loomis of Iowa State College told the American Society of Plant Physiologists of experiments in which they demonstrated that in the presence of toxic concentrations of carbon dioxide, roots first failed to absorb water and mineral nutrients, particularly potassium and nitrogen, and finally died. Too high a concentration of the gas proved fatal even to swamp plants like rice.

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Cork Isn't Waterproof

➤ CORK isn't completely waterproof, no matter how good it is for stoppering bottles and floating life rafts. When a plant's roots are thirsty enough they can pull water right through the thin layer of cork that covers all but the youngest of them, Dr. Paul J. Kramer of Duke University discovered through experiments.

The thinnest and most delicate portion of a root is its almost microscopically slender tip. This is the only portion that is not cork-sheathed, and for this reason it has long been assumed that water was absorbed only through root tips, or the zone just back of them.

However, when Dr. Kramer attached sensitive instruments showing water absorption rates to the older, corkier parts of the roots of both evergreen and broad-leaved trees, he found that water went through, in small but positively measurable quantities. He was able to show water absorption through the cork layer also when he substituted artificial suction for the natural pull of the tree's transpiring leaves.

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Magnesium was first produced commercially in the United States in 1915 when the war cut off the former German supply; domestic production was started for the Army for use in tracer bullets, star shells, flares and flashlight powders.

Government restrictions on *zinc sheet* for use in making printing plates have been relaxed, and plate-makers may use this metal at the 1941 rate.

GENERAL SCIENCE

Postwar Shortage

Even after fighting ends, it will be years before graduate students come from undergraduate classes. Plan offered to speed professional training.

➤ A PLAN for meeting the acute postwar shortage of trained professional men by an accelerated program of graduate study was outlined before the American Psychological Association meeting in Cleveland by Prof. Sidney L. Pressey, of the Ohio State University.

In the college year 1942-43 the number granted advanced degrees in U. S. institutions of higher learning dropped 30% from the 25,000 who received graduate training the year before, Prof. Pressey said. Soon afterwards some graduate schools were reporting that "the graduate student is practically extinct." It is estimated that even after the war is over, it will take three or four years before the normal flow of students from undergraduate colleges to graduate work is reestablished.

In addition to the acute need for professionally trained persons, demand for acceleration of graduate programs will come from returning service men, already mature and experienced in positions of authority who want their degrees without further delay, Prof. Pressey predicts.

Graduate training needs overhauling, anyway, Prof. Pressey believes. It is just about as it was imported from Germany about 80 years ago and put on top of an entirely different and longer system of earlier education. Before the war in Germany, the average age for receiving a doctor's degree was 24. In the United States it was 30—an age when some of the most creative years and the prime of life, physically, are already past.

First change that Prof. Pressey would make in the graduate program would be to admit students to graduate study on the basis of ability rather than previous degrees. He would count relevant war or work experience in the assessment of ability.

Then, he would find out experimentally just what kinds of work persons with graduate degrees actually do, and plan the curriculum to fit them for those specific duties. We should get away, he said, from the feeling that actual doing of a particular type of professional work is relatively unimportant if only there have been enough courses and readings about it. He would increase the internships.

He would do away with the final oral examination as the main criterion for granting a degree. It is, he said, literally a heritage from the middle ages. It should be kept, but its role would be supplementary. The student's work in internships as well as class would be considered as well as abilities and personality.

The graduate programs would improve rapidly, Prof. Pressey suggests, if graduate students were given more hand in things. At present they have less to say about policy than do undergraduates in many colleges or even students in high schools. Real participation by students would bring invaluable help in understanding and dealing with student problems, especially those of veterans.

Finally, Prof. Pressey urged that his colleagues act more like scientists and less like lawyers in putting into effect reforms in the graduate training. Try new things, experimentally, he recommended, and see how they work.

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MILITARY SCIENCE

Grasshopper Planes Now Lay Telephone Wires

➤ GRASSHOPPER planes, the little flying jeeps that carry observers for spotting artillery fire, have taken on a new job. Flying low and slow—height about 200 feet, speed 65 to 70 miles an hour—they quickly lay telephone wire from forward observation posts on the ground back to the gun positions.

Two artillery officers, Capt. Richard Leffers and Lt. George W. Maddox, tell how it is done (*Field Artillery Journal*, September).

Most critical task in preparing to lay wire from the air is the winding of the wire in rolls from which it can be pulled rapidly without jerking or kinking, which would cause breaks. These rolls are spliced into a series, which rides end to end in a cylindrical container lashed to the wing struts, close to the fuselage. Telephone instruments are dropped on small parachutes.

Science News Letter, September 23, 1944