

and plants, not because we are interested in them, but because they all have applications to man.

It was suggested that I talk to you on the Biological Future. Well, this speech is behind us and all the future is before. Predictions are always precarious and almost all the "Sensational Science" of which the newspapers and the public are so fond, is the science of the future, the prediction of things to come. A few years ago an enterprising publisher issued more than 100 booklets on the future of everything from electricity to swearing. I am not going to add to this too long list of prophecies. But you are going to be leaders in science; some of you are going to be leaders in biology. What opportunities will biology offer you for the increase of knowledge? I shall list only a few fields where there is great need of more knowledge.

Opportunities Ahead

1. Which one of you will be the Darwin of the future to discover the unknown factors of evolution? It is generally recognized that some great factor, perhaps as great as Darwin's Natural

Selection, is still undiscovered. Biology is today in much the same position that physics was in before the discovery of radio-activity. Who will be the Madame Curie to find the missing element?

2. Who will be the Pasteur of tomorrow to discover the causes of cancer? This great discovery may come from a biologist, as Pasteur's discoveries in the biology of infection and immunity came from a chemist. Several years ago the Director of the Crocker Cancer Institute said to me, "We are waiting for you biologists to give us a lead."

3. Who among you will be the Morgan of the future to find out how the genes, those inheritance factors in the chromosomes, direct the development of a plant or animal or man. We know that they do direct this development, but the manner of their action is largely unknown.

4. Finally, who among you will be the

Columbus to sail the uncharted sea between the living world and the lifeless one. This has been the great unknown, by some thought to be unknowable, but recent discovery of viruses, bacteriophage, and things so small that they go through the finest porcelain filters, seem to bridge this gulf between the living and the lifeless. The new electron microscope offers one means of transport into this newest world. Who will embark with the Admiral of this Ocean Sea.

I close with another quotation from that great scientist, Louis Pasteur, which has been inscribed on the walls of his tomb in the Pasteur Institute in Paris: "Blessed is he who carries within himself a God, an ideal, and who obeys it—ideal of art, ideal of science, ideal of the gospel virtues; therein lie the springs of great thoughts and great actions; they all reflect light from the Infinite."

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NUTRITION

Food Is a War Weapon

All major powers have nutrition problems. Government responsibilities in field increase. Fight food waste by eating what is on your plate.

By DR. M. L. WILSON

Associate Director in Charge of Nutrition,
Office of Defense Health & Welfare Services

Excerpts from Science Service's "Adventures in Science" program over the Columbia Broadcasting System during the Science Talent Institute attended by the 40 winners of the Second Annual Science Talent Search for the Westinghouse Scholarships.

➤ FOOD ALWAYS plays a dominant part in wars. It is a weapon, just as guns and ammunition, for men cannot fight when they lack strength to march. Nutrition, and through it, the ability to do a good day's work, is of the utmost importance in wartime. No country is free from problems of nutrition. All the major powers are concerned with it. In this country and Great Britain, however, much is being done to keep civilian, as well as armed-force strength in that state of well being that can only be achieved when the right food is eaten.

Developments in nutrition are paralleling those in sanitation. When people first heard of the germ-theory of disease, they began boiling their own water, watching their milk supply. Gradually

public sanitation developed and such matters became governmental responsibilities. For some time, well-informed people have been watching their eating habits, but recently groups and nations have come to recognize their responsibility for promoting good nutrition. Great progress has already been made in the medical and public health fields through acceptance of nutrition.

It is up to each individual to learn what to eat for health and to put that knowledge into practice. Fight food waste by eating what is on your plate. Help the local nutrition committees plan for food conservation demonstrations. Help with home gardens and community canning projects.

These are not small things. These are large things, for it is only by adding all these small things together that we can build the large. One man does not make an army, but one man, plus another and many others do. So it is with nutrition and science. Everyone working at what he can do best, all of these added together to make the whole—that hastens victory, and gives us strength to build a better world.

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INSTITUTE SPEAKER—Dr. M. L. Wilson, associate director in charge of nutrition of the Office of Defense Health and Welfare Services, speaking on the *Adventures in Science* program from the Nutrition Luncheon of the Science Talent Institute.



VITA-MIN-GO—After the Nutrition Luncheon, the Science Talent Search winners played a game based on the vitamin content of the food eaten. The game was directed by Miss Marjorie M. Heseltine, director of nutrition of the U. S. Children's Bureau. Left to right, William Weidman Piper, of Columbus, Ohio, Dr. Stuart Henderson Britt, one of the judges, G. Edward Pendray, of Westinghouse and the Institute staff, and Miss Heseltine.

CHEMISTRY

Thorium in the Sun

Radioactive element, rare on earth is discovered on sun by means of spectrum lines. It was found to occur only in the ionized state.

► **DISCOVERY** of the rare radioactive element thorium in the sun is announced by Dr. Charlotte E. Moore of the Princeton University Observatory and Dr. Arthur S. King of the spectroscopic laboratory at Mt. Wilson. The element was found to occur in the ionized state only.

Although search for thorium started in 1938, the investigation was hindered by lack of suitable experimental work on the spectrum of the element in the laboratory under different conditions of temperature and magnetic field strength. When such experimental work recently became available the search was begun anew and this time was successful.

Basis for the discovery was chiefly detection of lines in the solar spectrum that matched the lines of thorium most easily produced in the laboratory and which are generally the strongest lines of an element. These are known as its ulti-

mate lines and if they are absent it is hopeless to look for any others.

One line of thorium which stood out in strength above all others and was therefore believed to be its ultimate line coincided almost exactly with a faint unidentified line in the solar spectrum. Other strong lines of the ionized element could only be tentatively identified with solar lines. But as the very strongest line of thorium is represented so weakly in the sun the absence of the other lines is not considered surprising.

Two of the strongest lines of neutral thorium coincided with solar lines but the agreement was believed to be accidental from another line of evidence. Since sunspots are about 1,500 degrees Centigrade cooler than the surface of the sun surrounding them, they should contain less ionized thorium and consequently more of the neutral atoms. Hence, if the lines really belonged to

thorium, they should be strengthened in the spectrum of sunspots. But since the lines were not strengthened in the sunspot spectrum the investigators were forced to reject the coincidences as accidental.

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NUTRITION

Breakfast To Prevent Mid-Morning Fatigue

► **THE REASON** so many people get tired at 11 a.m. and 4 p.m. and feel weak and trembly is that the American people have gotten out of the habit of eating a good breakfast and a good lunch, Dr. Russell M. Wilder, of the Mayo Clinic, told the Congress on Industrial Health sponsored by the American Medical Association in Chicago.

Fruit, jam on toast and coffee is a bad breakfast, Dr. Wilder declared. Such a breakfast throws sugar into an empty stomach, the sugar gets into the blood quickly, and gets used up quickly. Then comes a drop of sugar in the blood, with a tired, weak feeling that people are likely to try to overcome with more sugar in the form of soft drinks or candy.

When you skimp on one meal, you must make up for the deficiencies of vitamins and other nourishment at the next meal, or your body does not get enough nourishment. People who skimp on breakfast, however, usually also skimp on lunch, Dr. Wilder pointed out. That leaves only dinner to supply almost all of the day's nourishment.

Breakfast, he said, should start with a source of vitamin C and some sugar in the form of fruit. Next, it should furnish the B vitamins. This can be done by a satisfactory portion of whole grain cereal or whole grain or enriched bread. If the bread is toasted, it should be only lightly toasted as much heat will destroy the vitamins.

Breakfast should have some fat in it, because fat delays the emptying of the stomach and prevents the sugar from getting to the blood so fast. Therefore include butter or oleomargarine enriched with vitamin A. It should also have some proteins, which can come from an egg or meat. The egg also supplies some fat. Finally, it should have a source of calcium, which is furnished by milk. Coffee adds nothing to the body's nourishment, so Dr. Wilder suggests that those who like coffee had better take it with hot milk to make sure of getting their milk.

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