

GENERAL SCIENCE

Science Outlook for 1952

Shortage of scientific manpower is problem for coming year. Possibility of test of hydrogen bomb foreseen. Research on using sun's energy will continue.

By WATSON DAVIS

See Front Cover

► IF THE world continues to teeter on the brink of an all-out world war or if an armed era of relative peace is established during 1952, continued progress in many fields of pure and applied science, technology and invention can be expected. Widespread destructive war would wreck many advances in progress.

The question of scientific and technical manpower will become more critical in the coming months. Defense and industrial leaders realize that steps must be taken to encourage capable young people to enter into scientific and engineering study if the United States is to keep up with the Soviet Union in available scientists and engineers. Uncertainties of the draft and possible universal military service, coupled with the likelihood of presidential election year smears upon actively constructive efforts, may interfere further with steps to remedy the shortage.

Use of new forms of atomic weapons will be made if more widespread war develops. These will include small atomic bombs propelled by artillery or guided missiles used in support of ground troops.

There is a chance that the fusion or so-called hydrogen bomb will be tested, but probably the public will not know whether or not it is successful.

Atomic Power Applied

Significant advances in use of atomic power for propelling submarines, other ships or airplanes will not come to fruition in the next year although intensive development will continue. Commercial use of atomic power will be delayed by military applications.

Information on the making of fissionable uranium 233 (useful in bombs) out of thorium will probably be obtained in the Arco, Idaho, breeder reactor, but it will be held secret.

Research on photosynthesis, the capturing of sun energy, will continue, but without more expenditure of brains and money on this key problem decisive practical results during the coming year hardly can be expected.

Before the secret of photosynthesis is discovered and duplicated, the energy of the sunshine may be utilized more effectively

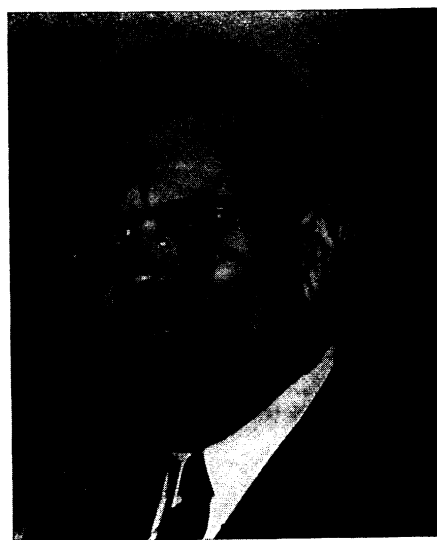
through the use of some of the lowly, one-celled plants, the algae. Experiments on mass production of *Chlorella*, one of the green algae, should tell us in the coming year whether it can be used as food for people or animals and whether it is an economical and practical raw material and energy source.

Shown on the cover of this week's SCIENCE NEWS LETTER are the test tubes on the top of the building at Cambridge, Mass., from which scientists hope a commercial process for a new food source will emerge.

In medicine, look for more new surgical operations, including on the heart, and more use of "banks" from which nerves, bones, and other body replacements are used for successful repair of damage caused by disease and accident.

There is always the chance that a new antibiotic, of the class of penicillin, will be proved useful, even upon one of the more resistant and serious diseases.

Much research will be done upon the key medical problem of treating effects of the powerful radiations of the atomic bomb. As a result we may be in a better position to save some of those who may be in range of any atomic bombs that are dropped.



AAAS PRESIDENT-ELECT — Dr. Edward U. Condon, director of research and development, Corning Glass Works, is the new president-elect of the American Association for the Advancement of Science.

There will be continued inquiry into individual human differences with the chance that refined biochemical tests and metabolic determinations will be used to detect them. Such research approaches promise to aid our understanding of normality as well as of mental illnesses. There may be advances in treatment of mental ills as a result.

Better human relations in factories, communities and even between nations are likely as more recognition is given to the psychological and sociological factors in communicating information, ideas and motivations.

Because we live in a world in which the proportion of older people is constantly increasing, better understanding of the aging process and means for counteracting the effects of growing old will be sought with some success in the near future.

Nutrition Factors

Some new factors or trace elements needed for healthy nutrition in man, animals, insects and plants will probably be discovered, adding to the multiplicity of vitamins and other elements that are known to be necessary.

A total eclipse of the sun will be seen from a path across middle Africa and the troubled Near East. Astronomers will observe it, probably at Khartoum, making optical and radio observations upon it. Some new facts about the ionosphere and effects of solar radiation upon it will probably result.

Discovery of hundreds of variable stars in the nucleus of the Andromeda nebula will be announced.

The mystery of the stars that are known, not by their light, but by radio microwaves emitted by them, will probably be solved in part by the identification of the source of the radiation.

The world's largest coronagraph, a device for artificially eclipsing the sun and observing its activity, will go into service high in the American Rockies to give more information on the effect of the sun on radio communication, weather and other terrestrial happenings.

The new kind of electronic device, called the transistor, which replaces the conventional and more bulky electron tube, will be used more widely, with one application making possible smaller-sized hearing aids.

New understanding of protein structure being obtained will begin to explain chemical processes, particularly in living matter, with the chance of application to medicine and genetics.

Electronic computing machines will be applied to more problems during the year, some of them non-military.

Forecast Last Year Told Many Happenings of 1951

► THE SCIENCE forecast for 1951 issued a year ago by SCIENCE SERVICE saw fulfillment during the past year in a number of instances.

The difficulties over the admission of foreign scientists to the United States due to the McCarran act were predicted. Due to an unwillingness of astronomers from non-iron curtain countries to go to Soviet Russia for international astronomical meetings scheduled for early August 1951, these meetings were postponed, as the SCIENCE SERVICE forecast anticipated.

They might have been moved to the United States except for the barriers that the McCarran act placed in the way of even temporary entry into the United States of foreign scientists who have had any connection, however remote, with communism or nazism. International chemical meetings in New York and Washington lost some of their leading scientists because of the rigid congressional enactment.

As forecast, the exploration of atomic particles in cosmic radiation continued, with the possible discovery of the anti-proton or negative proton.

The National Science Foundation put

into effect a national fellowship plan to speed fundamental scientific research, as predicted.

The secret of how the green plant utilizes sunlight, the process called photosynthesis, was under continued investigation in a number of laboratories, with the Atomic Energy Commission putting \$200,000 a year into such research, but as the SCIENCE SERVICE forecast suggested, photosynthesis could not be duplicated artificially in that short time.

The continued rocket and jet developments predicted resulted in the announcement of the beginning of quantity production for our armed forces of the Matador guided missile.

The expected expanded use of antibiotic drugs continued, with aureomycin being applied to a precancerous condition. Cortisone progress also continued and synthesis from more plentiful raw materials was announced during the year.

The need for building psychological and social foundations for future peace, pointed out in the forecast a year ago, was fulfilled in a measure by the formation of the Psychological Strategy Board within the U. S. government and the barrage of message-carrying balloons that were sent into iron curtain countries from free Europe.

Science News Letter, January 5, 1952

ASTRONOMY

Survey by Moon's Shadow

► A NEW method for calculating the exact size of the earth is being developed by astronomers. Some day the shadow of the moon, cast when it passes between the earth and a bright star, will be used in surveying.

The lapse of time between the instant the moon's shadow strikes the earth at one location and at another spot farther east is lengthened 50% by the fact that the observers are moving forward with the rotating earth, Dr. John A. O'Keefe and Miss Pamela Anderson of the Army Map Service told members of the American Astronomical Society meeting in Cleveland.

The shadow of the moon cast by one of the heaven's brightest stars can occasionally be seen on a clear night. The shadow cast by a less bright star is seldom seen, but it can be recorded with a photo-electric device. The instant the star's light is cut off can be timed with extreme accuracy as the moon has little if any atmosphere at all and the light is cut off quite suddenly.

When two observers at different positions on the earth time the instant the shadow of a particular feature of the moon is cast on the ground, the length of the path followed by the shadow of this feature of the moon is readily calculated.

Within the last year or two, teams of photoelectric observers and surveyors from the Army Map Service of the Corps of

Engineers in four pairs of locations in the western part of the United States have timed the passage of the moon's shadow from one location to another. The shadow cast by the same star was observed on the same night for each pair of observations.

"The agreement between velocities of the shadow as calculated from theory and the observed shadow velocities was excellent," Dr. O'Keefe stated. "The average discrepancy between the computed and the observed position of the shadow was 38 feet."

The earth's radius is believed chiefly to cause this discrepancy. This distance from sea level to the center of the earth enters the calculation in two ways.

Science News Letter, January 5, 1952

INVENTION

Easy Newspaper Reading For Bifocal Wearers

► EASY READING of the top of a newspaper without tilting the head back is promised the wearer of bifocal spectacles with a vertically adjustable type which brought patent 2,578,318 to Henry Ronicker, West Milton, and Roy A. Horn, Dayton, Ohio. They enable the wearer to raise the line of vision through the short focal areas to a horizontal position.

Science News Letter, January 5, 1952

TECHNOLOGY

Water-Injection Important In Recovering Additional Oil

► RESTORING PRODUCTIVITY of oil wells exhausted by the ordinary pumping to additional production by water pressure was a subject of vital importance at the meeting of the American Petroleum Institute in Chicago. Vast additional quantities can be obtained by water-injection, it was stated, to meet present and future needs in defense and civil activities.

The East Texas salt-water injection program has become the most important conservation measure ever applied to an individual field in the United States, the petroleum scientists were told by Paul D. Torrey, Oil Recovery Chemicals, Austin, Texas.

"It is indicated that this program," Mr. Torrey declared, "will result in the recovery of an additional amount of oil which will be larger than the combined primary and secondary production of most of the world's individual fields."

In the water-injection method, water under high pressure is forced down a central well to drive oil through the rock formations in which it is deposited to the pumping wells.

Unit operations to accomplish maximum recovery of oil and gas from a production pool are adding hundreds of millions of barrels to the reserves of the United States, the petroleum men were told by H. H. Kaveler, Phillips Petroleum Co., Bartlesville, Okla.

Ultimate recovery is substantially independent of the well spacing and the number of wells drilled, Mr. Kaveler said.

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