

GENERAL SCIENCE

Science Previews for 1949

Cancer test may be found for mass surveys; radioisotopes give promise of better understanding of diseases; new drugs will be sought to conquer infections.

By WATSON DAVIS

► WHAT new discoveries and inventions can the world expect in 1949?

Advances are likely in medicine and health.

A new test for cancer may be found that can be used like the X-ray screening for tuberculosis. This would spot cases early when something can be done about them.

Discovery and exploration of physiological and chemical mechanisms through use of radioisotopes give promise of allowing new advances in understanding heart and arterial diseases, arthritis and other ailments.

Mass application should be made of the new preventive and curative measures against venereal disease.

New chemicals for the conquest of infections, possibly those virus-caused, will be sought.

Patients with deep-seated cancer of internal organs will be getting treatment with 20,000,000-volt X-rays. This radiation will come from the high voltage machine, called a betatron, now being adapted for cancer treatment and research. High energy electrons from this machine may themselves be tried for cancer treatment, instead of using them to create X-rays by bombarding a platinum target.

New Elements

In chemistry, there are good chances that new elements will be manufactured. These will be elements 97 and 98, made to order in the atomic piles or cyclotrons. They will be fleeting substances, highly radioactive and not of immediate utility, like the atomic-bomb element, plutonium, also a synthetic element.

In physical and atomic science, there will come new knowledge about the fundamental particles or entities of which the atoms and radiations of the universe are composed. We shall know more about the mysterious mesons, born naturally of cosmic rays, made artificially for the first time in 1948. New kinds are likely to be discovered.

Some more giant atom-smashers, equal in power to the 400,000,000-electron volt machine at Berkeley, at present the world's largest, will be completed and may begin to be used in research.

The world's largest atomic chain-reactor (pile or "furnace") for research purposes will start operation at Brookhaven National Laboratory on Long Island, and will be used to produce radioisotopes with which

new knowledge in many fields can be obtained.

Work will be continued on the great problem of photosynthesis. The way in which the green leaf utilizes the energy of the sunshine and makes starches, sugars, cellulose and other plant products is still something that man can not duplicate. Carbon 14 radioisotope and tritium, triple-weight hydrogen, are being used as tracers. The needed clues for the solution of this great problem may be discovered during 1949. Conceivably this may be more important than the discovery of the release of atomic energy and the peace-time use of atomic energy.

Isotopic Research

Isotopes, some of them radioactive and others stable, are being used to attempt solutions of several hundred problems, among them the discovery of the exact mechanism of industrial chemical processes. Out of such work there may come new chemical products and simpler and cheaper ways of making old products.

The great rush to utilize petroleum as a chemical raw material will continue, with new syntheses that will make commercial some materials that have not yet emerged from the laboratory.

In the application of electronics, one or more of the giant electronic computers will probably be completed. Some of them will be available for use upon the results of the 1950 census or earlier trials in population counting. There is hope that such machines can be applied to economic problems of many variables and long and intricate computations.

Weather forecasting may get aid from the development of the speedy and intricate computers, since it would be possible to utilize and evaluate many more pieces of information collected by observers in sufficient time to give forecasts before the weather happens.

A new electronics is in the making through discoveries of semi-conducting properties of metals and compounds. Some important new electronic phenomena of this sort may be expected to bring new applications or better ways of performing old functions. Electronic devices of this new sort, such as the transistor, demonstrated in 1948, may make the present vacuum tubes obsolete for many purposes.

Radio relay circuits will continue to spread farther across the face of the American continent, carrying television, telephone, telegrams, facsimile and radio signals to transmitting stations at well-

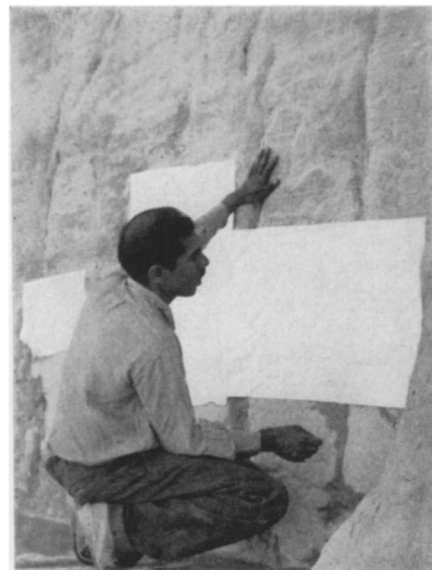
located points, thus expanding our communication services.

In the detection of infra-red radiation or heat of short wavelength, there will be developed greater sensitivity that will bring new applications in many fields, from medicine to astronomy.

The great 200-inch telescope on Mt. Palomar during 1949 will finish its major adjustments and observe with some effectiveness, but it will take longer than a year in all probability to make any major discoveries with it. The lesser Schmidt-type telescopes are likely to discover a nova or two and add materially to our knowledge of the universe.

Great collections of photographic plates pictures the universe as seen by a dozen or more telescopes through the years. If sufficient money can be found to mine this rich record of the constitution of space, we should be able to learn more about whence the universe came and whither it is going, how big it is and whether it is expanding.

New and better photocells for measuring heat and light from the stars and nebulae



ANCIENT PERSIAN INSCRIPTION—Squeeze paper is shown being applied to a monumental inscription on a mountain cliff in a remote desert fastness of Iran, which was discovered by Richard N. Frye of Harvard University. It is expected to give new information about Zoroastrianism, the religion of ancient Persia.