

GENERAL SCIENCE

Science Forecast For 1957

The year of the missiles predicted, with first launching of satellite. Anti-matter to be studied in giant accelerators. Russia will get biggest atom smasher into operation.

By WATSON DAVIS

► THE YEAR 1957 promises to be the year of the missiles. Long enough in design and development to be about ready for major testing and perhaps going into production, the ICBM, or intercontinental ballistic missile, should be prominent in this new year, although the public may hear relatively little about the tests unless there are mishaps.

The first of the earth satellites to be launched by man's inventiveness will sail upward on a three-stage rocket. There will be great interest when the earth is first circled by a sphere full of mechanisms that will send back to earth by radio messages what is observed.

We must have confidence that the peaceful use of rockets and missiles will be the important events of 1957 space exploring, not the flinging in war of missiles with H-bomb warheads.

The far-flung study of the earth during the International Geophysical Year, or IGY, actually an 18-month period beginning July 1 next, will begin to produce results. There should be major additions to our knowledge of Antarctica from the numerous expeditions of several nations upon that great expanse of ice.

Anti-Matter Studied

Discovery of the anti-proton in 1955 and the anti-neutron in 1956, through their manufacture in the University of California bevatron, will lead to the production by that great accelerator of stronger beams of anti-particles. The reactions of these particles with ordinary or positive matter, such as exists normally around us, will be intensively studied.

There will be further study and speculation as to the rather bizarre consequences of anti-matter and even a whole duplicate universe or at least galaxies that are composed of anti-matter.

These and other particles, correctly called "strange" by the physicists, will cause both experimental and theoretical exploration. In Russia a ten billion electron volt atom smasher to be the world's largest—contrasted with the six Bev of the University of California, present world's record holder—will go into operation.

We can therefore expect the Soviet physicists to take a temporary lead in exploration of matter's composition, since they will have an instrument more powerful than anywhere else in the world.

Meanwhile in the United States, plans

are afoot to build larger and larger accelerators, with a planned 25 Bev machine under construction at Brookhaven. The possibilities of using a couple of accelerators, each of 15 to 20 Bev, are being explored by Midwestern Universities Research Association.

The astronomical yardstick for measuring the universe in the space around us in which light takes less than a million years to travel will probably be further revised as a consequence of revisions in the luminosities of Cepheid and cluster type variable stars on which the distances are based.

As a consequence of the studies of radiation dangers and the scientific and public discussion of this problem that affects the present and future generations, the Atomic Energy Commission is expected to reduce the biological safe dose or tolerance level for radiation.

This will have an important effect on the H-bomb test situation and on laboratory shielding requirements. It will also mean

nuclear power wastes must be much more carefully controlled. Nuclear power development will be affected by this new requirement and the atomic power plants may be somewhat delayed and more costly.

The application of radioisotopes to industrial uses, as in food and drug sterilization and in speeding chemical reactions, such as petroleum cracking, will accelerate. A multi-curie fission product plant to separate large quantities of cesium 137, strontium 90 and other radioactive by-products of reactors is scheduled to begin operation in June.

Search for Cancer Drugs

It is perhaps too early to expect a breakthrough in the intensive search for a chemotherapeutic agent for use on some kinds of cancer, but the intensive research effort now underway will continue through 1957, with trials of any drugs found promising.

Chronic diseases and aging will continue to receive emphasis in the U.S. Public Health Service research program. Medical research facilities will continue to be expanded. The national health survey will begin to produce results useful in planning the needs of the nation.



ROCKETS AND MISSILES—This British ramjet engine, named Thor, is symbolic of the rockets and missiles that will make more flights than ever in 1957, both experimentally for defense purposes and in preparation for launching of artificial satellites for the International Geophysical Year. The Thor pictured is much smaller than most missiles and is designed to propel at speeds of more than 1,000 miles per hour.

The successful attack on polio through the use of Salk vaccine will result in a continued decline in polio incidence.

Continued development and use of tranquilizing and euphoriant drugs will continue to bring hopeful progress to the treatment and control of mental disease. Some of the new drugs for use in mental disorders will be more effective and less complicated by side-effects.

Chemical studies of some forms of schizophrenia may give a basis for understanding that will result in a break-through in the treatment of this disease.

Treatment of human abnormalities will receive clinical and experimental attention through studies of the biochemical aspects of individuality and chemotherapeutic methods.

In research upon the hormones, particularly the pituitary, there should be progress in correlating chemical structure with biological activity.

Look to Russia and Asia for new discoveries of the remains of fossil men. Because of their geographical position, Soviet scientists have the best chance to discover and report new finds that could revise our ideas of the ancestry and area of origin of the human race.

Spurred by accidents during 1956, there will be in 1957 air traffic control at all altitudes, both on and off airways. The Civil Aeronautics Administration contemplates a much wider use of radar in air traffic control.

Due to the increased use of helicopters in ferrying passengers from outlying airfields to convenient locations in the middle of cities, safe standards will be put into effect for heliports in downtown areas.

The national science youth program of science clubs, science fairs and accelerated aid to science teachers will continue to bring results that promise to alleviate the shortage of scientists and engineers.

In more than 150 localities in the United States, science fairs will be held and the top science exhibits from these fairs will be shown at the National Science Fair in Los Angeles in May. Some 200,000 young scientists will participate in this nation-wide activity.

Postmortem on 1956

The science forecast for 1956 made by Watson Davis, director of SCIENCE SERVICE, and issued a year ago was fulfilled in many instances.

The concern over the damage of atomic radiation to those now living and to be born in the future was justified, since there were extensive reports by scientists and debate on atomic bomb testing played a leading role in the presidential campaign.

The beginning of operation of the British 60,000-kilowatt atomic power plant was forecast. Testing of atomic weapons by the United States, Russia and Britain continued as foreseen.

The expectation of the continued exploration of subatomic particles was fulfilled by the discovery of the anti-neu.ron.

The mass use of Salk vaccine for polio did result in a reduction of the incidence of the disease. The application of tranquilizing drugs to mental patients continued with gratifying results.

The application of the image converter to large telescopes to increase their power did not progress as fast as expected, but there were obtained more data about the depths of the universe as expected.

Science News Letter, January 5, 1957

TECHNOLOGY

Use Plastic Bags for Carrying Live Fish

► TRANSPORTING TROPICAL FISH in plastic bags, such as those in which refrigerated vegetables are kept, seems to be practical, according to Kenneth Norris and William McFarland, University of California at Los Angeles ichthyologists, and scientists at Marineland, a southern California aquarium.

The plastic bag technique was originally devised with air transport in mind. The heavy metal containers formerly used to ship live fish resulted in high air freight costs.

It was found that tropical fish could be kept safely for a limited time in a sealed plastic bag of water in which the air had been displaced by pure oxygen. When a chemical buffer is added to the water, the fish can remain in the bag for several days without harm.

The buffer helps maintain an acid-alkalinity balance in the water necessary for the fish. It also seems to act on the fish, slowing down their activity and conserving energy.

During transport the bag is placed in a protective cardboard carton.

Science News Letter, January 5, 1957

PHYSIOLOGY

Officer Sets Altitude Record While on Ground

► A HIGH ALTITUDE record of 198,770 feet has been reached by a man who never left the ground.

The Air Research and Development Command, Baltimore, Md., reported that Maj. Arnold I. Beck reached the nearly 38-mile altitude in an aero-medical test chamber at its Wright Air Development Center, Dayton, Ohio. Maj. Beck is a college professor, recalled to military service in January, 1954.

Maj. Beck's altitude record is the highest simulated height ever reached by man.

Science News Letter, January 5, 1957

BIOCHEMISTRY

Study Nature of Virus Infection Core

► FURTHER LIGHT has been shed on the nature of the infectious core of a virus.

Studies by Drs. William Ginoza and Amos Norman of the Atomic Energy Project at the University of California at Los Angeles indicate that the entire nucleic acid component of the tobacco mosaic virus is essential for infectivity.

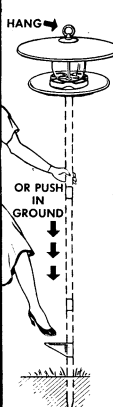
Recent research has shown that the nucleic acid core of the virus is by itself infectious. The protein shell surrounding this virus apparently does not enter into the infective process.

The question was then raised whether the entire nucleic acid complement of the virus was essential for infection or whether a fragment might be infective.

The UCLA studies indicate the entire nucleic acid core must act as a unit for infection to occur.

Other aspects of the study suggested that the nucleic acid component of the virus is a highly ordered structure whose length is very close to that of the virus itself.

Science News Letter, January 5, 1957



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