

GENERAL SCIENCE

Science Forecast for 1958

A rocket may reach the moon this year and there will be more satellites, with two possibly joined together as first step toward a space platform.

By WATSON DAVIS

► A ROCKET may reach the moon in 1958, not a man-carrying space vehicle but a more modest missile. This may be aimed to circle the earth's natural satellite. Or it may splash a gentle sign of man's prowess on the moon's surface, perhaps a marking dye. Or it may explode a hydrogen bomb on the moon, where it will do less harm than on earth, even if it contaminates that heavenly body.

A rocket to the moon is no 1958 certainty, but it is not too much harder to get to the moon than it is to launch a big satellite.

There will certainly be more ventures by man's rocket creations into outer space. Additional satellites will be launched by both Soviet Russia and the United States. There may be beginning attempts to join two satellites together, the first step toward a space platform.

One of the earth-circling satellites may carry a television device that will spy upon all portions of the globe's surface successively as it orbits, which would be useful for knowing and forecasting the weather but also in a dangerous way useful for military purposes.

Facts by "Beeps"

More important for future knowledge will be facts that satellites, both American and Soviet, will return to earth by their "beeps" as to what exists in outer space just above the earth's atmosphere. Scientists are curious as to what exists 180 to 600 miles above the earth, what atoms and ions are there and how densely placed they are. This information is important for understanding many natural phenomena and for future space explorations.

Defense-wise, there will be more rockets and missiles readied, tested and put into production in a rush to catch up with the Soviet progress, if that nation actually is ahead of the United States in that field. Due to secrecy, we are much more likely to know when things go wrong and there are failures than when there are successes and significant progress.

There will be very high balloon flights taking apparatus for many hours above 99.7% of the atmosphere. This will settle the open question as to whether there exists in the cosmic radiation the hearts of light elements, lithium, beryllium, and boron. This will give clues on the origin of the cosmic rays, for such light nuclei may be evidence for gigantic thermonuclear reactions in the universe.

Construction will continue on four new

high energy accelerators for exploring with immense energies the constitution of matter.

Princeton and Pennsylvania Universities are building a three billion electron volt proton synchrotron, Harvard and M.I.T. a six billion electron synchrotron, Brookhaven National Laboratory a 30 billion proton synchrotron and CERN at Geneva also a 30 billion proton synchrotron. The last three use strong focusing magnets and therefore form a new class of accelerators. All of these powerful "atom smashers" are planned for completion in early 1960 and assure major new discoveries in the atomic field.

Reporting Cosmic Dramas

In the gigantic cosmic "machines" that are in the galaxies and aggregations of stars, there may be discovered that new differences exist in such familiar objects as variable stars and clusters. Although at times both the satellites which are so relatively close to us and happenings on the surface of the earth monopolize our attention, there are cosmic dramas being performed in the vast spaces of the universe that our telescopes, receiving both light and radio waves, will watch and report.

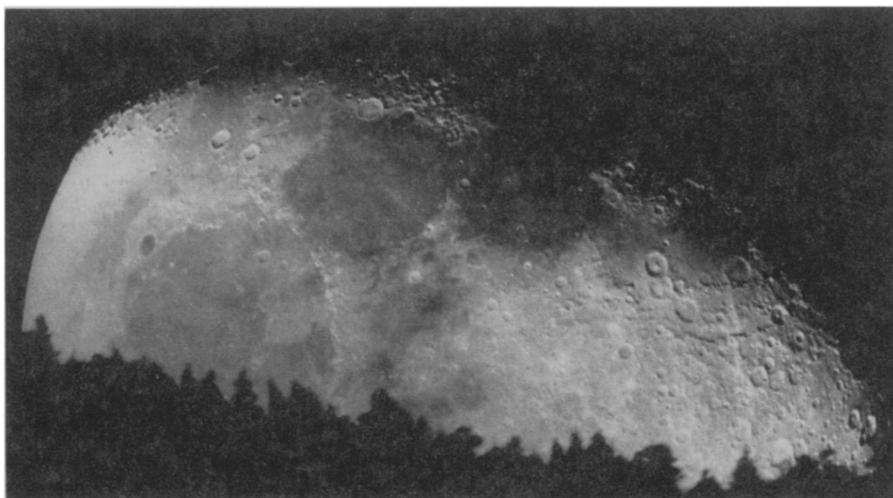
Radio astronomers are hopeful that 1958 will witness the practical use of the maser in radio astronomical problems. The maser, named from "microwave amplification by stimulated emission of radiation," is a device that causes solids to oscillate at micro-

wave frequencies and makes possible higher amplifications. Applied to radio telescopes it is expected the utility of these relatively new viewers of the universe will be increased a hundredfold.

Control of the nation's constantly increasing air traffic will receive the benefit during the coming year of elaborate devices that work more rapidly than human abilities. Computers, memory drums, data processing apparatus are now required to speed up air traffic control because of the increased number of passenger flights and the appearance of jet planes. The human mind and voice are no longer fast enough. The result of progress by the Civil Aeronautics Administration will be safer air transport.

The big research push against cancer may begin to pay off in saving doomed lives. A chemotherapeutic agent against cancer is the most dramatic possibility in medicine today. It will take months and years of clinical testing and evaluation, even if the hoped-for discovery is made. There are two methods of attacking the problem of cancer from a research standpoint. One is a widespread search and testing of all possible drugs, thousands of them, on the shelves of the pharmaceutical houses or synthesized for the purpose. The other is extensive basic research into the fundamental nature of malignancy. More money is being spent at the moment on the drug testing, but it may be that the fundamental research, slow as it seems, will pay off first.

The fight against virus diseases will continue, with the common cold, a multiple disease or bundle of diseases, as a target for progress in 1958. Some of the other diseases that plague us consistently may give signs



MOON IN DETAIL—The waning moon rising over Mt. Elden in Arizona, photographed by Arthur A. Hoag with the relocated U. S. Naval Observatory 40-inch telescope at Flagstaff, shows features of the lunar surface in clear detail. The tree line is nine miles from the telescope.

of being brought under greater control, as polio has been by its vaccine.

There is the possibility of a new epidemic of an old disease appearing somewhere and threatening to sweep the world, as Asian influenza did in 1957. Medical scientists will keep alert to this and we can be confident that defenses will be built against any natural disease menace, just as during the war and since there have been major advances toward being ready to counter any attempts at disease or bacteriological warfare.

Euphorants Needed

A great need in the modification of human personality now is recognized as a way of elevating the mood of an individual by means of a drug. Tranquilizers have been achieved and are in wide use, both in the general population and in mental hospitals. Now euphoriant drugs are needed. These will have usefulness in treating depressions, both those that reach the seriousness of needing psychiatric attention and possibly even the day-by-day "down in the dumps" feeling.

The youths of America who want to become the scientists, technologists and engineers so urgently needed for the future may get a "break" in 1958. Due to the sputniks and fear of Soviet scientific and educational progress, there may be more resources for bolstering scientific interests on the part of students, particularly in our secondary schools. There may be extensive support voted by Congress and scholarship programs of considerable size.

The effective method of helping boys and girls in their teens do their own science projects and experiments, as inspiring preludes to science careers, will get reinforcement, nationally and at local levels. More than 300,000 youths will do science projects and exhibits and show them in thousands of science fairs in schools and in over 150 regional fairs, which will culminate in the National Science Fair in May at Flint, Mich.

Boys and girls will ask more questions than ever. They will have fun and learn by doing, aided by the experts and the teachers in their community. A continuing renewal of the scientific and engineering manpower of the nation will result.

Postmortem on 1957

The science forecast for 1957 made by Watson Davis, director of SCIENCE SERVICE, and issued a year ago was fulfilled in many respects.

It was "the year of the missiles" as predicted and "the first of the earth satellites to be launched by man's inventiveness" did "sail upward on a three-stage rocket," although it was not a U. S. but a Soviet achievement.

The International Geophysical Year began to produce results, as foreseen.

There was progress in the building and operation of large "atom smashing" accelerators and the Soviets did take the world's lead with a ten billion electron volt machine, run at 8.3 Bev, although still bigger accelerators began building in the United States, as also forecast.

The Atomic Energy Commission did reduce, as expected, the biological safe dose or tolerance level for radiation.

The search for a chemotherapeutic agent active against cancer continued on an enhanced scale, but, as also expected, there was not a "breakthrough."

There was, as anticipated, an important discovery of fossil man, the Neanderthal skeletons in Iraq.

The national science youth program accelerated even more than foreseen, due to the situation following the sputnik satellite launchings.

Science News Letter, January 4, 1958

TECHNOLOGY

A-Power Plant Operates At Full Power

► THE WORLD'S first full-scale nuclear power plant designed and operated exclusively for civilian use began operating at full power on Dec. 23, 1957.

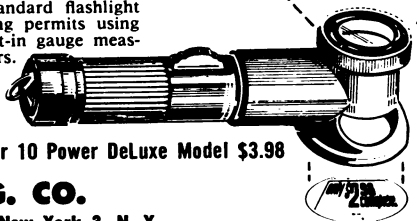
The Shippingport Atomic Power Plant delivered, on a test basis, 60,000 kilowatts of electricity net to the Duquesne Light Company's system in the Pittsburgh, Pa., area.

Science News Letter, January 4, 1958

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