GENERAL SCIENCE

1953 Science Forecast

Technology for war will dominate science for coming year. Fresh water from sea is important project. New medical quests foreseen. Science probing into nature of life itself.

By WATSON DAVIS

➤ THE MAJOR emphasis in science and technology in 1953 will continue to be upon machines and methods of military usefulness in order to make our nation stronger. Fear of further communist aggression will control our intellectual as well as our industrial future, even if further actual attacks do not occur.

Hidden by military security, new air weapons that will outmode both the pursuit plane and bomber are being developed. Human pilots are on the way to becoming obsolete, while the possibility of delivering an atomic or hydrogen bomb anywhere on earth from anywhere else is approaching reality.

During coming months we shall probably hear more about these aerial weapons, but the ultra-speedy jets and intercontinental bombers will hardly be replaced within the coming year or even several years.

The true intercontinental guided missile will some day actually exist. It will be capable of delivering with accuracy to any point on the earth's surface an atomic bomb of great destruction, and its speed and altitude will make it most difficult to intercept.

Such an aerial weapon rationally should be a great incentive to world peace, but the emotions and distorted minds of aggressive men do not seem to be susceptible to being guided into the paths of peace as surely as weapons are developed.

Test More Atom Weapons

More hydrogen or fusion super-bombs will be tested in 1953, and an atomic bomb will be fired from the new atomic cannon. Power from the atom for military purposes will not be actually applied, and the use of atomic power in any major way will still be for the future at the end of the year.

Our atomic energy program will continue to expand, with new facilities for making and processing atomic materials. More use for the radioactive debris of fissionable material from the atomic reactors will be found, with consequent benefit to medicine and industry.

To support our essentially military technology, more and more scientific and technical personnel will be needed, and the present and future manpower shortage in science and engineering will continue a matter of concern.

The search for methods of capturing the sun's energy more effectively than conventional agriculture will continue, although this field will not be given a fraction of the support that it should have. There may, nevertheless, come the great discovery that will allow science and industry to beat the green leaf at its own game—artificial or industrial photosynthesis.

Water is one of the most precious natural resources in many areas and its shortage urges onward to practicality the desalting of the ocean to obtain fresh water by methods that can be afforded financially. Demonstration plants may operate in 1953.

In much the same way that yellow fever has been conquered potentially by a practical vaccine, polio research may bring a successful vaccine so that little children will not be paralyzed by this disease.

For cancer the same kind of progress is not likely, but there are non-poisonous chemicals that are being tried in various laboratories and their effects may yield new and promising paths of attack.

The exploration of the universe, with instruments and astronomical intellects, will continue. Radio waves from distant parts of space will bring to the new radio telescopes additional evidence of stars, clouds and phenomena that would forever remain hidden to conventional light-capturing telescopes.

As human knowledge of the cosmos expands, its dimensions change and new light is thrown on our place in the vast order of things. Look for some new dimensioning of the space.

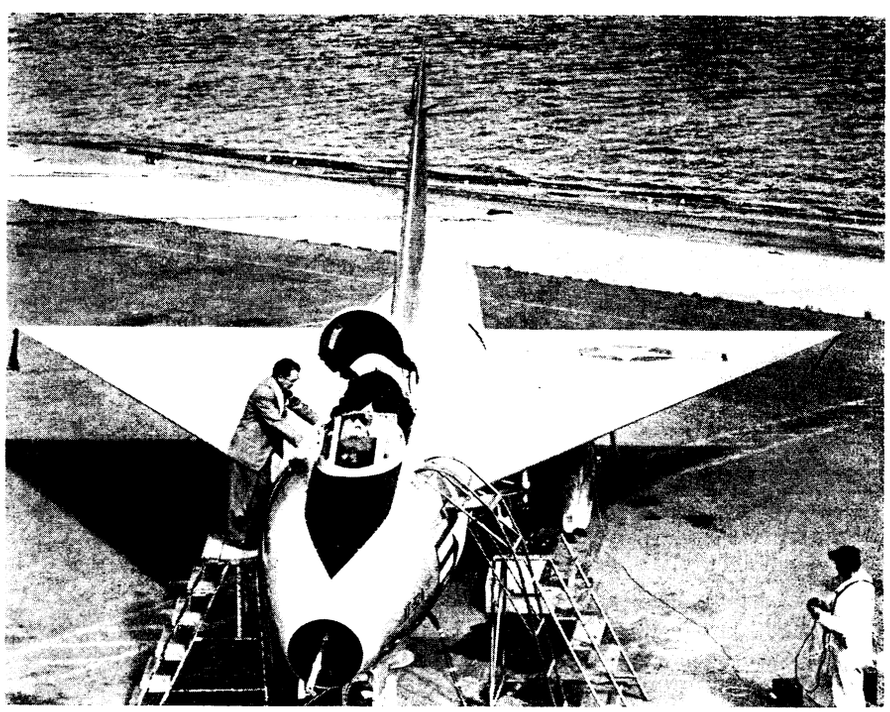
Through the application of the numerical computers or "brains" that operate electronically, there may come some improvements in forecasting the weather, which is now done by human analysis and synthesis of a spread of observational information. Tests will be made in 1953 to see whether masses of world-wide figures can be fed into the computers to produce results as reliable as the synoptic forecasts of today.

Self-Programming Computers

Systems under which electronic computers will "learn" to set themselves up, or "program" themselves, before starting a computation, will be developed. This will take a big load off the mathematicians supervising the machines.

Applications of transistors to communication and other electronics fields will continue, with development continuing. High temperature rectifiers and transistors made from silicon and silicon alloys will come into wide use. Our telephones, TV and radio sets, radar and everything else electronic will benefit from this wide new field.

The chemical configurations of molecules that make up the fundamental but still complex building blocks of living substances,



FUTURE PLANE'S SHAPE—The airplanes and rockets of the future, in the ranges beyond the speed of sound, will have the general configuration of this research craft, the Convair XF-92A delta wing research interceptor.

proteins, enzymes, genes, viruses, etc., are being explored. Comparable to the determinations of the parts of an atom or the particles wrapped up in the nucleus of an atom, these molecular studies may give in the near future new ideas upon which to build attempts to use the theories bravely for new medical cures, the juggling of heredity or the creation of new industrial processes.

Science does not shy at attempting to understand the mystery of life itself and how the universe began and grew. Theories as to how the earth began lead inevitably to considering how life began. What was the point when inanimate matter acquired the qualities that are called alive? What happened? Has it happened only once or many times? Is it happening now and will such acts of creation occur in the future? Can man, himself evolved from some such simple beginnings, set up the conditions for a new rise of life?

These are questions for the future, and 1953 is probably much too soon to get the answers. Here is a field that the comic strips have not yet invaded. The problems of life are far more important than even those of atomic energy. Such research should be more fruitful than attempts to establish an artificial earth satellite or space platform, or projected rocket shots at the moon, with or without monkeys or men as passengers.

There is so much to be done on earth for peace on earth, in the old-fashioned, non-Soviet sense of the word.

Science News Letter, January 3, 1953

AVIATION MEDICINE

Escaping Space Crash

➤ LOOKING FAR into the future when man will be space-traveling, Dr. Fritz Haber of the Air Force's School of Aviation Medicine, Randolph Field, Tex., reported to the American Rocket Society meeting in New York that chances are poor you could escape and survive a rocket ship disaster.

If something caused the rocket ship to explode so that it lost all of its air pressure quickly, the ship's crew probably would be killed almost instantly. Experiments have shown that men probably would be sucked through the hole in the ship. Even if they were wearing pressure suits, they probably would not survive.

But if the crewmen could leave the ship through a decompression chamber, their chances of survival would be slightly better. If the accident occurred "fairly near" the earth, rescue ships could be dispatched to pick them up quickly.

But if the accident occurred deep in space, the crewmen probably would be lost. Their space suits would not keep them alive long enough to be rescued even if they could be found.

If the accident occurred in the realm now believed suitable for an earth-circling space station, the crewmen probably would plummet toward the earth. Whizzing into the atmosphere at speeds about four times the speed of sound, their bodies would be crushed by the tremendous braking action of the air. The braking action would produce a decelerating force of about 300 g's, far more than the human body can withstand.

And even if the deceleration force were not serious, the heat generated by air friction, about 36,000 degrees Fahrenheit, would ignite any material used on the outer surface of the body.

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AERONAUTICS

Jet-Blast Problem

➤ SOLUTION OF airport problems created by the entrance of jet propulsion into civil aviation was discussed at a meeting in Montreal sponsored by the International Civil Aviation Organization. The principal problem is the effect on the runway of the fiery blasts from the jet engines.

Representatives from England reported that the giant Comet jetliners, now in use on several long-distance overseas routes, cause no trouble from their engine blasts. This is because the power plants are mounted relatively high in the wings and in a horizontal position. An American delegate pointed out that experimental work shows that serious pavement problems may be created by jet craft whose engines are mounted close to the ground.

Certain of these tests, he said, resulted in temperatures up to 500 degrees Fahrenheit at the surface of the ground. The use of rockets or afterburners to assist take-off, probably a necessity with jetliners at many airports, subject the runway pavement to much higher heat. Core temperatures of assisted take-off devices may be up to 5,200 degrees, with the speed of the exhaust gases around 7,000 feet per second.

Spillage of jet fuel from jet engines is another problem. With jets spillage is apt to occur. Any spillage from the aviation fuels used by ordinary planes is relatively harmless because such fuels evaporate quickly. Heavier fuels are used in jet engines and they evaporate slowly, with some sinking into the paving.

Runway length is an important consideration for jet-propelled aircraft. With conventional propulsion the twirling propellers are reversible and can be used to help brake the speed of the plane. Ordinarily jet planes rely entirely on brakes on the wheels of the landing gear similar to those used on automobiles. Trailing parachutes, however, have been used with success, and experimental work has been done with rockets discharging to the front.

Turning a jetliner around on the apron close to the airport station creates another problem. The fiery blasts from the engines may damage other planes or persons on the apron. A suggested solution involves leaving the plane close to the end of the runway and carrying passengers to and from it by buses.

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