

GENERAL SCIENCE

Science Forecast for 1954

Atomic submarine afloat during coming year. Guided missiles take up guard in Europe and Arctic. Conquest of polio may be proved.

By WATSON DAVIS

► IN THE months ahead in 1954, the world's first atomic submarine will be afloat, ushering in a new marine era, first for war and later for peace.

Guided missiles, some of them capable of carrying atomic bombs, will take up their positions in defense of the western world. They will both protect our great centers of population and stand guard in Europe and the Arctic.

A decade of secret research and production will come to fruition, as the radar-controlled pilotless craft will be constantly upon the alert to perform the interception of an attacking plane that would elude even our fastest piloted supersonic jets.

There will be more thermonuclear explosions, in the Pacific, to warn the world that it has within its own hands the mechanism for civilization's destruction. From behind the Iron Curtain, radioactive particles in the air would bring news of answering gigantic hydrogen bomb explosions. This will warn us that if there is to be real security for the world, two different ideologies must start talking to each other in earnest and work out ways to live upon the same globe.

We shall not know of many things that will strengthen our military defense in the months ahead, for much of our progress in fashioning new and novel weapons are kept military secrets.

Polio Vaccine Test

In the fields of science and research where progress can be more freely reported, it seems likely that a major medical conquest can be achieved. There is great hope that, through vaccinating a million children and comparing their polio rate with a similar untreated group, there will be demonstrated in 1954 the effectiveness of the polio vaccine against all types of this virus disease.

Following the interesting theories developed in 1953, we may come closer to the secret of life that is contained in the chemical molecules within the dividing cell. More theory and some experimentation on suggested mechanism of cell duplication may even give medical scientists new ideas of developing treatments for disease.

The inquiries into the number one cause of death, the diseases of the heart and circulatory system, will continue. There is always the chance that out of the chemical

research and work with actual patients some useful methods of prevention and treatment will arise. These may be based upon a better understanding of the constituents of the blood.

Cancer will be under continual attack. Most important will be the wide-flung attempts to understand the nature of this disease which takes many forms and probably has many specific causes. Treatment of the victims of the disease will be bettered, particularly by the use of larger amounts of radioactive cobalt 60. Amounts equivalent to hundred-pound lots of radium and more than 25 times as radioactive as radium will be used in cancer treatment centers. This is a medical by-product of atomic energy.

Steroid Hormone Metabolism

Other developments that are foreseen by some of the experts consulted by SCIENCE SERVICE as to what is likely to happen during 1954 include:

There will be marked advances in the knowledge of steroid hormone metabolism. This will allow tests for steroids to tell what the adrenal gland has produced before the hormones undergo metabolism in the tissues.

Something new about copper metabolism in patients with Wilson's disease, a degenerative disorder of the brain and liver, may be developed during the coming months.

The startling rise in early juvenile delinquency will lead to intensification of research into the normal behavior development of the pre-adolescent and early adolescent years.

General and pediatric medicine will give increased attention to the mental health of the family and its younger children.

Influence of Heredity

There will be inquiry into the influence of hereditary and constitutional factors in determining the potentials of normal and delinquent behavior.

A demonstration is probable that problem-solving by groups is not likely to be superior to that of individuals in the area of human relations.

Exploding atoms will continue to give new knowledge. Radiation detection devices in the form of scintillation counters will greatly extend the use of radioactive tracer atoms for many types of laboratory

research, medical diagnosis and industrial applications.

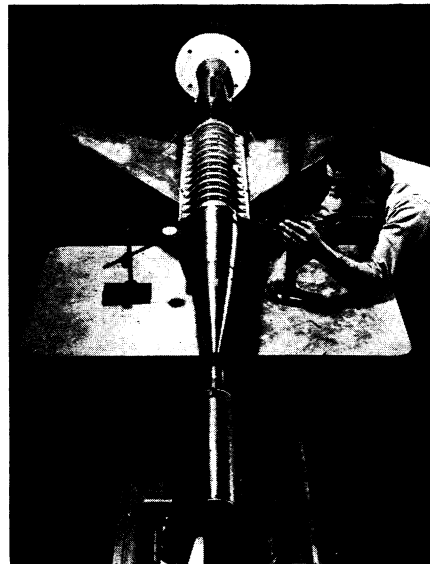
Radioactive dating based upon the long life of carbon 14 will continue to give us new surprises about the past history of civilization.

Because radiation from outer space of all sorts has a great influence upon not only our knowledge of the universe and our philosophies, but also upon the actual physical conditions here on earth, studies on cosmic rays, the upper atmosphere and radiation from outside the earth will be intensified.

Still more accurate weather predictions will be possible through further refinements of mathematical models of the atmosphere. Numerical weather forecasting will become operational and will be issued on a routine basis. Rough mathematical models designed for long-range weather forecasting will be tried out.

The exploration of the universe by means of radio waves that are emitted from various regions of the sky will be continued. It is expected that the Andromeda galaxy will be shown to be much larger when measured by the 21-centimeter radio waves that it emits than by light, just as last year radio observations showed the Magellanic clouds to be much larger.

Cathode-ray screens will replace the photographic plate in recording with electronic



FUTURE AIRPLANE MODEL—To determine its flight characteristics, this model is being readied for wind tunnel tests at a field station of the National Advisory Committee for Aeronautics.

receivers what is observed through telescopes.

The true nature of the variable stars in the Magellanic clouds are likely to be identified.

Astronomers will establish more accurately the new scale of the universe which roughly doubles linear distances, and, therefore, doubles the age of the exploding universe.

It is probable that a new formulation of what an elementary particle consists of will be offered during the year.

There may be more understanding of the superconductive state which causes electricity to flow so easily in metals at very low temperature.

Within our own earth, there will be new information and theories upon the fluidity of the earth's core. There may be convincing demonstration of how the continents originated.

The electronic "brains" which have had such development in the last decade will grow still more and become more useful.

Computing machines will make use of magnetic elements as active components replacing tubes and transistors. Significant improvements in reliability of electronic systems in aircraft armaments will be attained through correlated design.

Color television may arrive on actual broadcast schedules. Tape recording of television is likely to have its first practical broadcast use during the year.

The great jigsaw puzzle of man's origin will have more pieces fitted into it. Africa is the great continent of opportunity in anthropology. There are likely to be further interesting finds in Africa of ancient man and his cultures.

Science News Letter, January 2, 1954

ICHTHYOLOGY

Activity of Fish Told by Gill Size

► IF YOU ever wonder how much vitality a fish has, do not look at his muscles. The size of its gills is what counts.

Fast-moving, active fish, such as the mackerel and menhaden, are also fast breathers. They require a large gill area for their oxygen intake. Only sluggish, lazy fish, which rest and feed at the bottom of the ocean, like toadfish and flounder, can afford to grow small gills.

After measuring the gill surfaces of some 30 species of fish, Dr. Irving E. Gray, professor of zoology at Duke University, Durham, N. C., found at one extreme that the ocean-swimming mackerel carried an average of 1,617 square inches of gill surface for each pound of flesh. At the other extreme, the slow-moving toadfish carried only 127 square inches to the pound.

This difference means essentially one thing. If the toadfish were to swear off sedentary ways and attempt to take up the adventurous life of the mackerel, he would never make a go of it.

Science News Letter, January 2, 1954

How to Stop Worrying

HOW TO PAY FOR

YOUR SON'S OR DAUGHTER'S COLLEGE EDUCATION

EVEN if you don't think you can save another dollar these days, and you're wondering how you're going to get together \$5000 cash for your son or daughter—the minimum cost of a four years' college education today—

George Adams' big new book *How to Afford That College Education—and Where to Study* definitely and clearly tells you *what to do to assure your child his (or her) college education.*

In his details about 970 American colleges and universities, he tells you all about the loan funds, work-study plans, employment opportunities, the plans to cut tuition and living expenses, and the many other ways that virtually guarantee a college education to anyone who really wants one.

He shows clearly how you and your child can swing the last three years of college, if you can meet the irreducible cash needs of the first year. He shows how to provide for these cash needs *out of current income*, and he even shows clearly how you can build up a college nest egg for your younger boy or girl through the right savings and insurance plan.

This book does even more:

—it tells how to find the best college for your son and daughter, the one that will give them the best training considering their talents, abilities, and the future career they want. With the help of this book's rating chart, you can stop worrying "Which college?" and can open the way to a successful, well-paid career for your child.

Of course you get details, briefly, about each of America's 970 leading colleges and universities; their costs, courses, location, the help they give parents and students in cutting cash needs and expenses.

And your son or daughter learns still more: proved ways to earn one's way through college, proved campus businesses any intelligent college student can start, pre-college jobs from which a boy can save a full year's college expenses, the best kind of vacation jobs (combining vacations with good pay), etc.

You'd think it worth while spending \$25, \$50, even \$100 if you could visit a college adviser and get from him even a fraction of all the facts in George Adams' *How to Afford That College Education—and Where to Study*. So, when you're told this book costs only \$2 on a money back guarantee if not satisfied, why wait?

To do the best you can to assure your child's college education and his success in life, send \$2 (cash, check, or money order) with name and address and ask for "college book." Mail to:

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