

GENERAL SCIENCE

# Science Forecast for 1955

**Atomic submarine should make world's longest sea voyage. Military science still gets the largest play. Success of polio vaccine to be known.**

**See Front Cover**

**By WATSON DAVIS**

► IN THE year 1955, the effort to apply science and technology to military purposes will still have the ascendancy. Much of the progress will be held secret, as in recent years.

There will continue to be more atomic test explosions, both in the U. S. and Soviet atomic energy programs. There will be rising fear of the consequences of both the increasing numbers of tests and the dangers of atomic warfare.

The U. S. "atoms-for-peace" program may get to the stage of an international meeting, but it will have to be held in Europe because of the difficulties in the way of getting, for many of the scientists, U. S. visas for entry into this country under the McCarran-Walters act. The era of somewhat hopeful communication with the Soviets may continue and be aided by these discussions if they are held. The limitation of atomic warfare will not be on agenda seriously. The promising fact is that the two atomic adversaries will be talking with each other.

## First Atomic Submarine

Hidden in the dry-land atomic "submarine," located in the middle of Idaho and shown on the cover of this week's SCIENCE NEWS LETTER, is an experimental model of the engine that is expected to drive the world's first atomic submarine, U.S.S. Nautilus, on a record voyage in 1955.

It may make the longest continuous sea voyage in human history. More atomic submarines should approach completion, including in all probability one in the Soviet navy.

Larger, more accurate and longer-range guided missiles will come to fruition, but there will be little information issued on these military advances. Radar warning nets surrounding the United States and flung over Europe, the Far East and the Arctic will make America more secure from surprise attack by atomic bombers.

Work on some very practical atomic power plants, notably a relatively small one for emergency use by military and civil agencies, will be rushed, with some chance that one or more will be actually tested.

The generation of electricity directly from atomic radiation will continue in an experimental stage, although this may be the method of greatest promise in the

future. Solar batteries will have limited use, although such conversion of the sunlight into electric power is likely in the long run to be a more important energy source than uranium, thorium or lithium.

In medicine, there is always chance of a major sudden "break-through" on one of the unconquered diseases, like cancer, heart, etc. This might be a chemical that would stop cancer's unruly growth. For this to happen in 1955 should not be counted on.

The world should know during the coming months whether the polio vaccine given a mass test on children in 1954 is effective in lessening the frequency and severity of the disease.

By the same methods that were used in production of the polio vaccine, there may come a vaccine for measles. This may not get to the significant testing stage during 1955.

The many new antibiotics and other chemicals being produced with great hope should be watched for promise of treatments for diseases and conditions that are difficult to handle, or for better treatment of diseases under partial control.

## Secret of Green Leaf

The secret of the green leaf, how photosynthesis is accomplished in nature, should come closer to solution in 1955, building on the knowledge gained in the past year or so. Much of what has been believed about the manner of the plant's capture of the sun's energy has proved to be wrong, but new methods tell a new story of what happens.

If this stands up and man can duplicate it, we shall have found the treasure trove of energy at the end of the rainbow. However, this may be too much to expect in one year or even several years.

Science will continue to struggle with the mystery of life itself. This is wrapped up with the wonders of growth and the grand pageant of evolution and heredity. Answers to such questions will require many years, if they are ever attained.

Important in this matter of life and its origin are the amino acids and complex molecules of protein. Theory and experiment will continue to explore these frontiers. Similar methods will be put to work to determine structure of such drugs as ACTH and the possibility of their synthesis.

While these fundamentals are being approached, those who have the great task of treating the mentally disturbed in our population have hope of advances in the future.

Drugs promise aid in psychiatric problems. The alkaloids, rauwolfia or Indian snake root, thiorazine, LD25 and others have shown some usefulness. They may be employed both therapeutically and, quite as importantly, in increasing knowledge of the mental state of psychotics. In addition to these pharmacological approaches, the social sciences are being drawn upon to give assistance in mental hospitals where the human aspects are so important and helpful.

Some of the same drugs under test in mental treatment, such as rauwolfia, are also used in the treatment of hypertension or high blood pressure. Advances can be foreseen in this line of approach to one of the most prevalent of dangerous physical conditions.

## Differences of Individuals

Individuals who make up the population are being studied as to their differences as well as their similarities. A continuing reappraisal of the nature and origin of individual differences in men, women and children should lead toward a better understanding of our democratic culture in theory and practice.

Long-continued studies of individuals from birth to grave will be begun as a means of understanding child development as well as the aging processes.

This is research that will of necessity span more than one generation of scientists, and planning to make this possible may be begun in coming months.

Just as it is necessary to know what happens to the individual, much can be learned from man's rise through the ages. A complete ecological picture of the rise of man from his cave-dwelling stage to his residence in open towns will emerge from the Oriental Institute expedition working in northeastern Iraq near the Iranian and Turkish frontiers.

There will be a search in the spring by a Peabody Museum-Harvard expedition to western Pakistan for stone age connections between the Iranian plateau and the Indus valley.

Archaeologists expect that more solar ships will be located on the other side of the Cheops Pyramid in Egypt. Inspection of their contents may throw new light on the life of that little known Pharaoh.

To archaeology and to geology of recent times, radiocarbon dating may be expected to bring more surprises as this new research tool is made more accurate and increased in scale and so straightens out the story of man's past.

The same kind of very sensitive radiation counting that is used in radio-carbon dating will be applied to studies of human metabolism to help diagnose incipient diseases.

More atomic radiation available for med-

ical therapy will result from a plant to be built during 1955 at Oak Ridge, Tenn., to extract from the wastes or "ashes" of atomic furnaces cesium 137, which gives off intense gamma rays. The 200,000 curies per year to be extracted will allow the use of this radioactive material for food preservation as well.

There should be expected some clarification of the properties of the fundamental subatomic particles that are called K-mesons or charged heavy mesons, which physicists admit now are "in a mess." The theoretical and experimental exploration of other subatomic entities will continue.

The great telescopes of the world will be improved by the use of image converters, similar to television methods. These will increase the speed of spectroscopic observations and decrease the exposure time for bright objects, such as the planets and granulations of the face of the sun.

There will be progress in understanding the evolution of the stars and the structure of the galaxies. The expanding universe will have new dimensions due to a revision of the constant which is dependent on brightness and velocity that will result from photometric measures of nebulae.

There may be progress in discovering the origin of the main magnetic field of the earth and also the cause of glaciations in the earth's past.

A giant electronic computer will go to work making numerical forecasts of weather.

In aviation, 1955 will see the inauguration of regular operation in the United States of turbo-prop airliners.

Science News Letter, January 1, 1955

#### ICHTHYOLOGY

## Yearly Salmon Run

► SALMON FISHERMEN in the State of Washington may soon be catching pink salmon every year instead of every other year as is now the case. Attempts by Washington's Department of Fisheries to establish a run of pink salmon during even-numbered years have shown some promise.

"For the first time in history," stated C. H. Ellis, supervisor of the Department's hatchery management and research division, "even-year pink salmon have returned to Washington waters." Heretofore, pink salmon made their run only during odd-numbered years.

To establish the off-year run of pink salmon, the biologists obtained even-year spawn from Canada, but instead of liberating the fry just as they were ready to feed as was done in the past, they were reared in salt water until they attained a fair size.

In 1950, between 300 and 500 adult pink salmon reared in this manner returned to the Samish River. This group was allowed to spawn naturally and, in 1952, 50 adult fish returned. Again, the 50 fish were allowed to spawn naturally, but only a few returnees were observed this year. Pink

#### PSYCHOLOGY

## Public School Curriculum

► PRESSURE GROUPS rather than either educators or parents determine what should be taught in the public schools—at least in California, Dr. George C. Kyte, professor of education at the University of California, found in a survey reported to the American Association for the Advancement of Science meeting in Berkeley, Calif.

Well meaning organizations have been responsible for having many requirements written into the state law, he found.

"Practical entomology" was made a requirement with the idea that this would help orchard growers in fighting insect pests in California's citrus groves.

The WCTU is behind the teaching of "evil effects of alcohol, tobacco and narcotics."

The Grand Army of the Republic pressed legislation to introduce teaching of "civil government."

The California Club urged the teaching of "humane education," and similar subjects.

The Native Sons and Native Daughters are responsible for the teaching of the "history of California."

"Fire prevention" was added to the curriculum at the insistence of public and private organizations.

The American Society for Thrift, the War Loan Organization and the bankers' association got behind the introduction of "thrift."

salmon go out and return in two-year cycles. Each fish lives through only one such cycle.

"From this procedure, it became quite evident that a single generation transfer could be accomplished on the first return, but would fail to maintain itself under natural conditions," reported Mr. Ellis.

Consequently, the Washington fisheries experts have taken the eggs from another even-year planting, and these will be reared and planted from the two salt-water stations established in Washington in recent years.

Mr. Ellis pointed out that "all of the work to date has been entirely in the experimental phase, but we believe it holds some promise with a refinement in technique of developing a group with stronger homing instincts."

The establishment of an even-year run in Washington's waters, like that now enjoyed by fishermen in Canada and most of Alaska, will be more than welcomed by the Northwest fishing industry.

Science News Letter, January 1, 1955

The average hen lays 180 eggs a year.

Only twice in the history of California have educators had a voice in school legislation. Once was when John Pelton, a Massachusetts schoolmaster who went to California in the gold rush, was given the job of writing the original bill. Even then, legislators tacked on two additional requirements. The other occasion was in 1925 when citizens and school officials got together to map out needed revision of the legislation.

Recent polls show that what the public wants its children to learn in school are the three R's, U. S. history, civics, geography, the U. S. Constitution and Declaration of Independence. Rated as almost as important are morals and manners, accident prevention and training for healthful living.

Science News Letter, January 1, 1955

#### INVENTIONS

## U. S. Inventions Available Royalty-Free

► A PROCESS to extract rubber from a shrub and a ceramic anti-corrosion coating for metals are among the 308 government-owned patents available on a royalty-free license.

The inventions are printed in the last volume of a seven-booklet series, compiled by the Government Patents Board, which lists over 4,300 such patents. Since these inventions were developed with public funds, they are considered the property of the people. The patents are licensed on a non-exclusive basis.

Short descriptions of each invention are included in the booklet titled, "Ceramic, Paper, Rubber, Textile, Wood and Other Products and Processes" (see SNL, Dec. 11, p. 380).

The ceramic coating process protects critical metal parts from corrosion at temperatures up to 1,800 degrees Fahrenheit. Bombers' heat exchangers treated with this coating lasted up to 12 times longer than previously designed exchangers.

The rubber extracting process, developed by the Department of Agriculture, gives up to 95% yield from the guayule shrub.

Each of the booklets, which can be bought from the Department of Commerce, Washington, contains the patents of possible interest to a specific phase of U. S. industry.

The other volumes are "Instrumentation" (see SNL, Aug. 21, p. 124), "Chemical Products and Processes," "Food Products and Processes" (see SNL, Nov. 6, p. 300), "Metal Products and Processes" (see SNL, Nov. 13, p. 316), "Machinery and Transportation Equipment," "Ordnance" (see SNL, Nov. 27, p. 348) and "Electrical and Electronic Apparatus" (see SNL, Dec. 11, p. 380).

Science News Letter, January 1, 1955