

TECHNOLOGY

Titanium Electroplated

► SOME of the lighter metals which are important in aircraft, guided missile and other defense industries may soon be easily obtained in more useful forms if techniques developed at the National Bureau of Standards are put into commercial practice.

Bureau scientists have succeeded in electroplating light metals and refractory metals such as magnesium, titanium, zirconium and other metals or their alloys from solutions.

They have developed the technique into a possible commercial process which would plate the metals on a continuously moving strip. Such a process would be considerably faster and more economical than the fixed-electrode and "batch" solution processes now used in much electrodeposition work.

Titanium and zirconium are becoming increasingly important because of their high melting points and resistance to corrosion. Also, weight for weight, titanium is stronger than aluminum. Another of the metals readily obtained by means of the new process, magnesium, already has begun to replace aluminum in many aircraft components.

The deposits are obtained by electroplating the metals or their alloys from organic

solvents. Until now electroplating of these metals was not commercially practicable because the metals could not be deposited from water solutions in the way many other metals are.

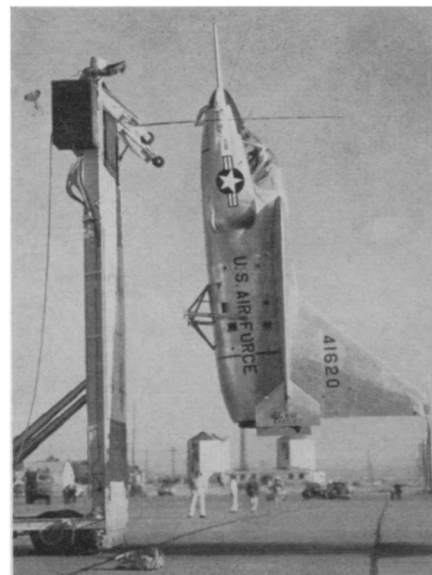
Plating from a bath of molten light metals also proved unsatisfactory, resulting only in a deposit of flakes or particles of the metal rather than a useful form.

Scientists at NBS dissolved complex compounds of the metals in ether, ethyl alcohol and other organic or organo-metallic solvents and plated from those solutions.

In the course of their studies of the process, they also discovered means for improving the electroplating and electroforming of aluminum. Their work was supported by the Wright Air Development Center, Army Ordnance and the Atomic Energy Commission.

After studying and eliminating many solvents, some of them too dangerous for commercial use and others not chemically satisfactory, the NBS scientists found the ethers, particularly ethyl ether, are the most effective for organic plating baths. Borohydrides, hydrides and halides proved to be the most useful solutes.

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VERTIJET—The Ryan X-13 Vertijet, the U. S. Air Force's pure jet VTOL research plane, is shown here with its ground service trailer. Depending solely upon thrust from its jet engine for both direct lift and high speed conventional flight, the plane can quickly make the transition from flight to vertical hovering and then hook on to its trailer.

VITAL STATISTICS

Population Figures Given

► BETWEEN FIVE and seven percent of all people born during the Christian era are alive today, according to P. K. Whelpton, director of the Scripps Foundation for Research in Population Problems, Miami University, in Oxford, Ohio.

This relatively high proportion reflects the great gains made in reducing death rates and lengthening life during the last century and the continuation of relatively high birth rates in such nations as China, India, Pakistan and Indonesia which have more than half of the world's people, Mr. Whelpton says.

The world's population at the beginning of 1957 amounted to approximately 2,700,000,000, according to the figures collected by the United Nations.

Estimates are less accurate as one goes back in time, but it is probable there were between 400,000,000 and 600,000,000 people living in 1650, and between 250,000,000 and 500,000,000 living when Christ was born, the population expert explains.

Less is known about birth and death rates than about population, but the available facts indicate the number of babies born during the last 1,957 years probably has not exceeded 55,000,000,000 nor been less than 40,000,000,000. The present population is about five percent of the larger number of births and seven percent of the smaller number.

What proportion of all the human beings ever born are now alive is a much more speculative question, Mr. Whelpton states.

Paleontologists believe the first man and woman appeared on the earth's surface not later than 100,000 years ago. Some of them interpret recent discoveries in South Africa to mean *Homo sapiens* goes back 1,000,000 years.

If the earlier beginning is correct, and if man's numbers increased rather steadily, but very slowly according to modern standards, from then until 5,000 B.C., the total number of babies born exceeds 300,000,000,000, and less than one percent of them are now living, Mr. Whelpton points out.

At the other extreme, if mankind began as recently as 100,000 years ago, and had long periods with little increase in numbers before 5,000 B.C., there have been only about 70,000,000,000 babies, and nearly four percent of them are alive at present.

In view of the fact the pre-Christian era of man's existence is 50 to 500 times as long as the present era, it is surprising the world may now have as many as one to four percent of all the people that ever lived. This illustrates the striking contrast between the stupendous increase of population during a few recent centuries and the extremely slow growth during previous milleniums, Mr. Whelpton concludes.

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PATHOLOGY

Describe New Kind Of Lung Disease

► DOCTORS at the University of California at Los Angeles Medical School have found a new kind of lung disease.

It occurs when the lung elastic tissue becomes hardened and, like a foreign body, produces an irritating effect on the lung.

The disease, observed in autopsied lung sections of 12 patients, is reported in *Archives of Pathology* by Drs. Roy L. Walford and Leo Kaplan. Their studies of it were carried out in cooperation with the Los Angeles Veterans Administration Center and the Mt. Sinai Hospital.

Symptoms of the disease include difficulty in breathing, cyanosis or improper oxygenation of blood and a heart condition secondary to the lung disease.

The doctors visualize the course of the disease, which was found to have run from one to 21 years, as follows. As a result of unexplained, perhaps multiple causes (allergic injury, metabolic or structural defects), the lung elastic tissue thickens and fragments. This makes it susceptible to iron impregnation, an "iron" lung, as it were.

Finally the iron-impregnated, fragmented tissue acts as an irritant and locally traumatic substance, which provokes a hardening foreign-body reaction in the lungs. The result is pulmonary insufficiency and a secondary heart disease.

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