

NATURAL RESOURCES

# Waste of Metals, Coal and Oil May Starve Machine Age

## Consumption Increased Thousand Fold in Past 100 Years Prompts Prediction of Exhaustion Almost Immediately

**T**HE MACHINE AGE may starve to death in the almost immediate future, victim of today's profligate use of metals, coal and oil.

To the scientists and engineers of the American Association for the Advancement of Science, Prof. Ross Aiken Gortner, University of Minnesota biochemist, observed that precious, irreplaceable stores of natural resources absolutely essential to modern industrial civilization are disappearing into the maws of industry and dissipated wastefully.

"In the last hundred years this lusty infant, applied science, has increased its food consumption perhaps a thousand fold," he said, "and unfortunately for mankind already the shelves in some of nature's cupboard show signs of exhaustion of specific food supplies."

While the publicity of technocracy calls attention to the part played by mechanical energy in remaking economic conditions, Prof. Gortner warns that the coal and oil supplying this energy will be exhausted within the next thousand years, which is but a second in the history of mankind.

More menacing is the approaching exhaustion of copper, antimony, tin, lead, zinc, chromium, manganese, nickel and iron stored in parts of the earth accessible to man.

These metals will probably be exhausted in less than one thousand years if used at their present rates of consumption, Prof. Gortner estimated. And the rate of use of some of them is doubling each decade.

In the past hundred years the tools of science have wrested from the earth from a tenth to half of the available natural resources. Man has enjoyed them for a moment, then destroyed them or cast them aside in a form useless to coming generations.

"In spite of the fact that the world's resources of tin are exceedingly limited, we still demand tinfoil around candy bars and packages of cigarettes," Prof. Gortner charged, "and the world's available sulfur supply is being rapidly ex-

hausted in the demand for cellulose products that have a silken sheen."

Iron will be exhausted at present mining rates in the following times: Germany, 40 to 50 years; Scandinavia, 100 years; United States, 100 years; Russia, 150 years; all the mines of the world, 250 years.

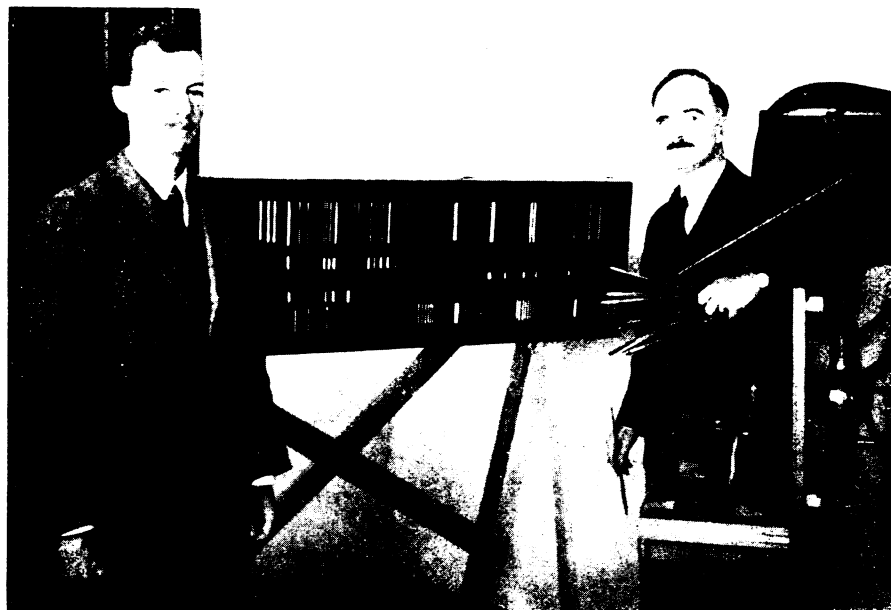
Copper, zinc, lead and tin will have been exhausted long before the iron is gone. America's supply of elemental sulfur will fail in fifteen years.

At present rate of consumption the coal of England will last about 50 years, that of France less than 300 years, that of Belgium less than 800 (*Turn Page*)

PHYSICS

## Artist Paints Spectra of Light in Upper Atmosphere

**C**HARLES BITTINGER, Washington artist-physicist, (right, in accompanying photograph) has painted the spectra of the lights that shine in the upper atmosphere of the earth and sun. Dr. E. O. Hulbert, physicist at the Naval Research Laboratory, Bellevue, D. C.



RAINBOWS OF THE UPPER ATMOSPHERE OF EARTH AND SUN

(left) collaborated with Mr. Bittinger.

The upper spread of colored spectral lines in the picture is that of the aurora that occurs in the upper air of the earth. Next are portrayed the bands of nitrogen as seen at the negative poles of a discharge tube, showing a close relationship to those of the aurora and supporting the idea that the northern lights are due largely to excited nitrogen.

The moonless night sky as seen through a spectroscope is next shown and next to the bottom is the spectrum of a meteor, based on information just obtained by Harvard College Observatory. The lower spectrum is that of the beautiful corona that is seen surrounding the sun only during total eclipse.

*Science News Letter, January 14, 1933*

ENTOMOLOGY

## Caterpillars Hear Sounds Audible to Man

**C**ATERPILLARS can hear. They hear sounds audible to human ears. This was reported to the meeting of the American Society of Zoologists by Dr. D. E. Minnich of the University of Minnesota.

He held tuning-forks of several pitches within the range of the middle piano keyboard over a sound box in which were caterpillars of fourteen different species. When he struck the forks the caterpillars served notice that they heard, either by stopping their movements or by vigorously contracting their longitudinal muscles.

*Science News Letter, January 14, 1933*