

GENERAL SCIENCE

World War Avoidable

Carnegie Institution president reports that for at least another generation world-wide conflagration may be avoided, but price is continual vigilance.

► ANOTHER WORLD war may well be avoided for at least a generation, Dr. Vannevar Bush, wartime head of the government's research and development, said in his presidential report to the trustees of the Carnegie Institution of Washington.

Observing that the avoidance of all-out war is a first condition of sound progress for our civilization, Dr. Bush stated that "the price of peace is to be continual vigilance and a heavy cost in maintaining sufficient defensive power among the free nations."

Discussing our economic system, Dr. Bush suggested that "perhaps we have learned to avoid periodic depressions and dislocations; at least we avoided a postwar slump."

Preservation of freedom and initiative which made this country great is no academic matter and touches science very directly, Dr. Bush declared. The trend toward centralization in government, facilitated by modern scientific techniques, could build a stifling bureaucracy in this democratic country as readily as in any other, he warned.

Government control of research, thus far, has not been onerous, Dr. Bush said, but there is danger under government subsidy and control that there may be an undue emphasis on the immediate and the applied and a lack of support for really fundamental science. Probably seven times as many dollars a year as before the war are now being channeled into research and development.

Industrial Research Boosts Production

Industrial research, Dr. Bush said, has aided more than is generally appreciated in boosting our productivity abruptly when we sorely needed it, and hence in carrying the burden of armament without sacrifice of the standard of living.

Among the Carnegie Institution's research activities in astronomy, terrestrial sciences, biological sciences, and archaeology, during the past year were:

The world's largest 200-inch telescope on Mt. Palomar has reached out and found a distant nebula that has an apparent speed of rushing away from our part of the universe of 61,000 kilometers per second (38,000 miles per second), over a fifth of the velocity of light. When still farther reaches of space are probed, and the recession velocities of nebulae reach a substantial fraction of light's velocity, astronomers hope to decide whether the red shift in this distant light really means that the outer

parts of the universe are flying apart explosively.

Studies suggest that two kinds of feldspar minerals in granite develop after complete solidification at the high temperatures at which this rock in the earth's crust was formed.

Grow Algae on Large Scale

Large-scale growing of the green alga *Chlorella* will shortly show whether or not it can be produced profitably and used as foodstuff or for other purposes.

First direct evidence was obtained that little bodies within bacteria are actually carriers of hereditary material and therefore are like the nuclei of cells of higher organisms.

The reproduction of minute invaders of bacteria, called bacteriophages, were studied and the phage particles were found to mate at least four times, on the average.

Isolation of a substance that holds the development of leukemic cells in check is

being attempted following discovery that heated leukemic cells do not produce cancer-like leukemia in mice.

The time at which, in the guinea pig, the rhythmic electrical changes in the brain, the so-called brain waves, first become detectable was discovered.

Small cavities appear in the heads of human embryos at about 27 to 29 days gestation age, it was discovered, although these transient evolutionary developments common to lower animals are not found in other mammals.

Exploration of the ruins of Mayapan, archaeological site in Yucatan, revealed houses and other evidence of everyday life, confirming Bishop Landa's early Spanish accounts of aboriginal Yucatan.

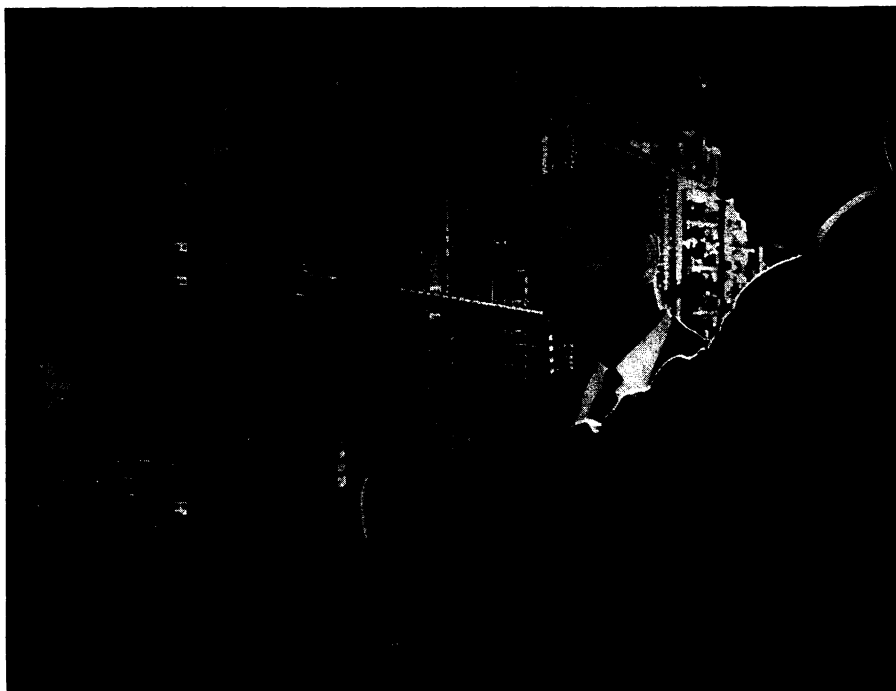
Science News Letter, December 22, 1951

ENGINEERING

Whirlwind, Ultra-Fast "Brain," Now Operating

► WHIRLWIND I, an ultra-high-speed digital computing machine, is now in operation at the Massachusetts Institute of Technology.

One of the features of this fast electronic machine, the only large-scale computer of its kind in full operation in this country, is its electrostatic "memory," which exists



"WHIRLWIND" OPERATION—With the ability to act upon and deliver information at a rate of 20,000 times a second, Whirlwind I, the high-speed electronic computer of the Massachusetts Institute of Technology, is suitable for supplying instantaneous instructions such as needed for controlling aircraft traffic patterns. The operation center is shown here.