



TEST "PILOT"—This network of massive pipes at the new research facility of Bendix Aviation Corporation connects the powerplant with actual test cells where supersonic speeds and high-altitude atmosphere are simulated.

PHYSICAL CHEMISTRY

Produce Element 99

Nitrogen, stripped of its electrons, is hurled at target of uranium 238 in a giant cyclotron to yield the newest man-made element, number 99.

► A NEW man-made element, number 99 in the series counted by atomic number, has been produced at the Radiation Laboratory of the University of California.

By bombarding uranium 238 in the laboratory's giant cyclotron with stripped nitrogen atoms at 100,000,000 electron volts, the uranium atom was made to take up, in one step, the seven protons necessary to change uranium, number 92, into the new atom, number 99.

At the same time, there were added to the uranium atom enough elementary particles from the excited nitrogen to give the new element an atomic mass of 247, making it to date the heaviest known on earth.

In three experiments, a total of only 40 atoms of the new element have so far been detected. These have resulted from experiments, not yet declassified, at Argonne Laboratory, Chicago, at Los Alamos, and at the University of California, the Atomic Energy Commission says.

The discovery and properties of the new element were predicted by Dr. Glenn T. Seaborg, Nobel Prize winner and discoverer of four of the man-made elements that follow plutonium in the list of elements.

Detection of the new element and measurement of its rate of radioactive decay is announced in *Physical Review* (Jan. 1) by Drs. Albert Ghiorso, Bernard Rossi, Bernard G. Harvey and Stanley Thompson.

The rate of decay of the new element is so high that one-half of it has changed to the lighter element berkelium in 7.3 minutes by giving off an alpha particle.

Chemical properties, as expected, are similar to those of holmium, element No. 67. Holmium belongs to a set of elements 58 to 71 inclusive. This set of elements is known collectively as the rare earth, or lanthanide series. A similar set of elements, named the actinide series, begins with thorium, element No. 90, and will end, chemists believe, with the still undiscovered No. 103. The new element, No. 99, is the tenth in the actinide series, and the seventh man-made element.

Because the actinide elements follow the lighter lanthanide elements one by one, the new element 99, which corresponds to holmium, is referred to tentatively as eka-holmium. The privilege of naming a new element is traditionally the discoverer's.

Science News Letter, February 13, 1954

AERONAUTICS

Jets to Get Full Workout In Ground-Based Test Lab

► A NEW jet-engine test laboratory in Teterboro, N. J., can simulate temperature and atmospheric conditions that jets encounter in actual flight from sea level to 80,000 feet.

The laboratory consists of two cells in which the engines are tested. Three thousand horsepower are required to operate these test cells. A project of the Bendix Aviation Corporation, the laboratory uses as much electrical energy as 3,000 average houses. Its cooling equipment could air-condition a 600-room apartment building. Air speeds beyond the speed of sound are at the beck and call of technicians.

The test cells are isolated from each other by heavy concrete walls. A further safety measure is the explosion-release "pop-off" roofs on the cells. Technicians watch the engine performance through periscope-type windows having bullet-proof glass. This gives even more protection.

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ELECTRONICS

Radar-Like Altimeter Meets Flying Hazards

► NAVY JET pilots soon will have an electronic, radar-like altimeter especially designed to meet the hazards of near-sonic flight.

The instrument will tell exactly how high the plane is above the ground at any instant. Instrument lag, a "bug" of air-pressure-type altimeters, has been eliminated in the electronic device. Thus if the altimeter says the plane is 5,000 feet above the earth, it actually is 5,000 feet high.

As the plane nears a chain of mountains, the altimeter warns the pilot that the ground is closing in on him. The pilot, who may be holding his plane in level flight, otherwise might be unaware that he is nearing jagged peaks.

When the clearance between plane and ground passes a pre-set minimum, a warning light flashes on to attract the pilot's attention.

This instant-acting, foolproof altimeter also hides its face when it makes an error. Should some stray signal cause it to read improperly, the device blanks out its face for an instant until the proper reading can be established.

Weighing 30 pounds, the altimeter's transmitting and receiving antennas are mounted flush beneath the aircraft's wings. It sends out tiny bursts of radio energy and listens for them to return after being bounced from the ground. The time it takes for the speed-of-light waves to return to the plane is converted into altitude for the pilot.

Built by the Raytheon Manufacturing Co., Waltham, Mass., the device has passed Navy tests and currently is being considered by the U. S. Air Force.

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