

ificate under such conditions would be decidedly misleading.

The first motor given an approved-type certificate by the Department of Commerce was tested by the manufacturer, and was approved by the Department on the basis of the manufacturer's statement. Later it was discovered that the motor had so much vibration as not to be practical to fly.

Consequently, for the next test, a Bureau of Standards expert, T. T. Neill, who has since been in charge of this testing work, was sent to the manufacturer's plant to supervise the testing. The third motor was tested at the Bureau's own plant.

Only \$60,000

This testing work, insuring the safety of fliers and the flying public, has cost the government an average of about \$60,000 a year. To save this sum, the work is being discontinued. Four engineers, four skilled aviation engine operators, and eight other skilled workers are being fired. Apparatus recently installed at Arlington at a cost of \$50,000 will remain idle as will also special equipment for the testing of air cooled engines under approximated altitude conditions, which represents another investment of about \$35,000.

Meanwhile experienced men are being lost to the government, who will probably have to be replaced when public pressure demands the renewal of this public service. The present arrangement of testing in the manufacturers' plants makes no provision for the small manufacturer who has not the expensive testing equipment necessary to meet department requirements.

As a last minute job, the men who have been fired rushed through two tests, each requiring 100 hours continuous running of the motor. This meant that a group of men being fired from the government service in a time of general unemployment worked night and day for eight consecutive days up until almost the moment of leaving.

Science News Letter, July 15, 1933

AVIATION

Altitude Laboratory Idle For Lack of Funds

THE ALTITUDE LABORATORY of the National Bureau of Standards, the only one in this country, and the only one in the world doing published research for the benefit of the public, will stand idle during the coming fiscal year because of lack of funds.

Unless funds are made available from public works projects to renew the work there of testing airplane motors on the ground under conditions like those at high altitudes, this laboratory representing an investment of about \$250,000 will not be used for the public service—simply because there is no money for the purpose.

When a manufacturer, or the Army or Navy, wants to know how a particular motor will operate at very high altitudes—or wants to know about the performance of a certain fuel or lubricant—it has been possible to make tests in the altitude chamber of this laboratory. Here the atmospheric pressure can be varied at will, as well as the temperature, the percentage of moisture, and other factors which are different at different heights above sea level. In other words the entire motor can be transported to conditions like those of any height up to 30,000 feet while the investigators remain on the ground and make observations of its performance.

Impossible To Manufacturer

No manufacturer is able to make such a test in his plant. He depends upon tests made when the pressure of the air fed to the carburetor is controlled. He has no way of controlling the pressure at the exhaust outlet, or the many other factors which affect the engine when it is actually in flight. None, that is, except the very unsatisfactory method of actually putting the motor in a plane and taking her up.

The U. S. Navy has facilities for controlling the pressure both at the intake and at the exhaust, but even they must rely on these approximate tests.

The plans of the altitude laboratory for the coming year included the working out of a correction factor which might be applied to such approximate tests to give some idea of what the performance would be when the motor was actually at altitude. So far no such correction factor is known. Yet the requirements of the Department of Commerce for altitude engines specify that they must be given either actual altitude tests or approximate altitude tests "corrected in a proper way."

The physicist in charge of the altitude laboratory who is being summarily fired without notice, or, technically speaking, "furloughed for an indefinite period," left industry during boom times to make a career of this work. He has now had five years' experience in the laboratory.

Science News Letter, July 15, 1933

AGRICULTURE

Experiment Station Funds Uncut for Three Months

THE AGRICULTURAL experiment stations of the various states will not have their federal funds cut by 25 per cent., at least during the first three months of the new fiscal year.

President Roosevelt's reorganization order chopped this regular annual appropriation by \$1,095,222 for the year beginning July 1, but the great damage that would result to fundamental research work in science and agriculture caused official postponement of the ordered cuts for the first quarter of the new fiscal year. There is hope that the cuts can be mitigated for the balance of the year also.

Although final action has not yet been taken, similar postponement of the 25 per cent. cuts in agricultural colleges and vocational education federal grants was made to apply to the first quarter.

The agricultural extension service has received full payment for the first half year.

Science News Letter, July 15, 1933

METALLURGY

Information Service on Metallurgy Closed

THE SCIENTIFIC staff which is being fired by the United States Government does not consist of long-haired men with peculiar notions. Neither are they individuals with low efficiency ratings or those whose services are rated by superiors as unnecessary. They are being dismissed, or "separated" and "furloughed" for one reason only—lack of funds. That is, in order to save the small amount of their salaries for use on such things as public works.

Typical of young woman scientists who are being dismissed is Miss Marjorie G. Lorentz, research worker on metallurgy at the National Bureau of Standards.

When builders suspect a flaw in the metal to be used, say in building a new airship or in withstanding the stress of a great building, they may test it by an etching process. They take a cross section of the metal, treat it with the right reagent, and then photograph it. The photograph, because of the action of the reagent, will show up occlusions, or imperfections, and also the shape of the metal particles.