

## 1,000 HORSE POWER ENGINES SEEN NEAR

Thousand horse power aircraft engines are a practical possibility, according to Glenn D. Angle of the U. S. Air Service, Engineering Division. He believes, also, that they can be constructed to weigh less than 1.5 pounds a horse power, — very important consideration, since the problem of aircraft engine designers from the first has been to increase power without greatly increasing weight.

Up to the present only 13 aircraft engines of more than 600 horsepower actually have been designed and built. Seven were French, three British, two American, and one Italian.

"The U. S. Air Service at the end of the war was without and reliable engine of more than 400 horsepower," Mr. Angle says in a technical statement prepared for the American Machinist. "The following year designs were laid down for an 18-cylinder, W-type engine of 2,778 cu. in. piston displacement. This engine is composed of three rows of six cylinders each, set at an included angle of 40 degrees, an arrangement which probably gives as compact an engine for the displacement as can be produced, having excellent inertia balance and in formity of torque delivered to the propeller.

"The rated horsepower was 700 at 1,700 revolutions per minute and 750 at 1,800 r.p.m., but the dynamometer tests showed a much greater horsepower. The original engine completed five 50 hour endurance tests. Never before has the first engine built from any design been known to make such a record.

"The weight is 1,770 pounds and at 800 horsepower represents 2.21 pounds a horsepower. Modifications indicate that the weight of the engine can be safely reduced to 1,500 pounds. The weight per horsepower would then be 1.87, the lowest ever obtained for an engine of more than 500 horsepower and lower, in fact, than for the majority of smaller engines.

"The reports of pilots are favorable as regards engine operation. The selection of this 18 cylinder type engine for outputs between 700 and 1500 horsepower has proved sound. The U. S. Army Air Service has the experience that indicates that successful engines of 1,000 to 1,200 horsepower can be built to weight less than 1.5 pounds a horsepower.

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## ISOLATION OF VITAMIN A CLAIMED BY JAPANESE

What they believe to be Vitamin A has been successfully isolated by two Japanese chemists, K. Takahashi and K. Kawakami. If this actually has been done it is likely to prove an important event in the progress of food chemistry.

Vitamin A, the fat soluble vitamin, is perhaps the most important of these mysterious substances now definitely known to exist. Its absence in food gives rise to rickets in children. It is closely connected with the growth of children and young animals.

It is abundant in butter, egg yolk, cod liver oil, milk, cream and most oily animal fats. Certain fresh vegetables, such as cabbage, spinach, tomatoes, and lettuce, have some of this vitamin. Long exposure to heat gradually destroys it

but ordinary cooking seems to have no effect.

Hitherto nothing has been known concerning its chemical structure and very little about its properties. The Japanese chemists, however, have analyzed the substance they obtained. Whether or not it is vitamin A remains a question for further verification.

They isolated it from cod liver oil, butter and egg yolk. After an involved chemical process a semi-crystalline substance was obtained, constituting about one tenth of one per cent. of the original material. This was found to be composed of carbon, hydrogen and oxygen, with no nitrogen.

A mouse at the point of death because of lack of vitamin A was given minute quantities of the substance daily and in ten days was restored to complete health.

Vitamin A has been considered in the nature of a catalyst, an agent with the power of bringing about extensive chemical changes without being itself altered in the process.

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#### BIG OCEAN SURVEY TO START IN GULF

Definite plans for the beginning of the greatest scientific survey of the ocean ever undertaken are contained in recommendations adopted by a Committee of the Conference on Oceanography, consisting of representatives from various technical bureaus of the Government and allied institutions, in session at the Hydrographic Office of the Navy Department. Reconnaissance of the Gulf of Mexico-Caribbean Sea region and neighboring parts of the North Atlantic and south through the Panama Canal to the Galapagos Islands is proposed, with later more comprehensive and intensive work in both the North Pacific and North Atlantic oceans.

These expeditions in a specially equipped ship, fitted up with laboratories for the examination of specimens taken at sea, are expected to yield information of the highest scientific and practical economic value to fisheries along our coast and farmers in the interior of our country.

Conditions of the western part of the Gulf of Mexico and Caribbean Sea are believed to have a definite bearing on the climate of the southern, middle western and eastern states, while geological exploration on the sea bottom around the Antillean chain may yield important knowledge about earthquakes and volcanic activity.

An inventory of the life in the sea upon which future generations will have to draw more and more for food is contemplated while important fishing banks of immediate commercial value may be located.

The exploring ship will be equipped with the sonic depth finder by which continuous sounding and accurate charting of the bottom may be rapidly carried forward. The scientific staff will be under the direction of three scientists of highest caliber; one an oceanographer, one a geologist, and one a biologist, according to the plans outlined by the committee.

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