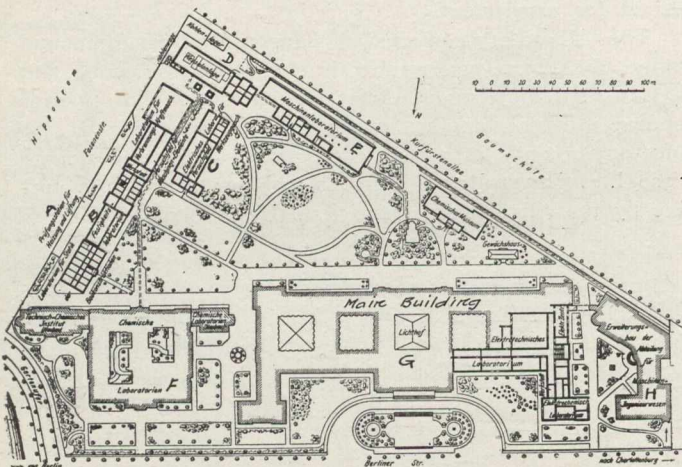


It should be stated that the descriptions of the apparatus are not complete, and in such an article as this it is possible merely to mention the more important machines.

The laboratory is under the direction of the well-known Prof. Josse.

(b) The Gas Engine Laboratory.—This laboratory, which is in charge of Prof. Riedler, is designed especially for testing gas engines and automobiles, although, as previously stated, there are a number of gas engines in the engine laboratory just described. The space available for this work is over 170 feet long, and varies in width from over 40 feet to about 70 feet, the height being about 25 feet, and all the light being obtained from the sides. The whole of the building is served by a ten-ton travelling crane.



Plan of Berlin Technical High School Grounds.

Starting from the lower left-hand corner and going up the side of the triangle the first building, A, is the laboratory for heating and ventilation research; the next, B, is for strength of materials and gas engine and automobile testing; C, the electrical laboratory; D, the boiler-house; E, the engine laboratory; F, the chemical building; G, the main building; H, the building for mechanical engineering.

The laboratory contains a 200 horse-power suction gas engine, with dynamo, constructed by the Vereintigte Maschinenfabrik, Augsburg. This engine, which is four-cycle and double-acting, has the latest type of valve gear, and is well adapted to testing. The gas for this engine is made by suction gas producers, of which there are two of 200 horse-power each, located in a separate building, the gas being led over to the laboratory in pipes.

In addition to the above there is a 40 horse-power Korting engine, a 25 horse-power Korting oil engine, a 20 horse-power Diesel engine, several other engines, special apparatus for doing research work on explosive mixtures, numerous gas meters, etc. The engines are all equipped with dynamos, which are used to produce the load.

A very interesting feature of this laboratory is the automobile testing plant, designed for testing the horse-power and tractive force of automobiles of all sizes and powers up to 200 horse-power. The power of the engine is determined by placing the automobile on a dynamometer driven by the back wheels of the latter, which dynamometer may be adjusted to suit any size of machine. Power is absorbed partly by means of dynamos and partly by Prony brakes, the former being very easily adjusted to give any load desired with great precision. The tractive force is also measured by a special device, which cannot be explained here for lack of space.

That this automobile testing plant is in great demand

was evidenced by the fact that there were five or six machines waiting to be tested when the laboratory was visited.

There are also testing floors available for other purposes, space being left below these so that access to the lower side of the floor may be easily obtained.

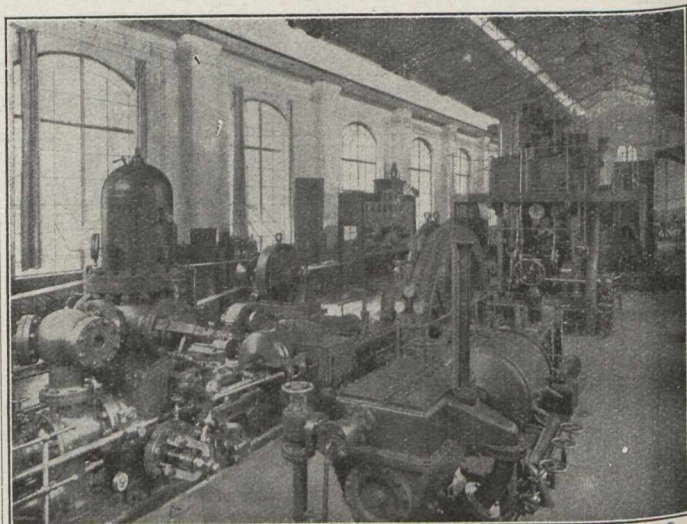
(c) Laboratory for Testing Belts and Machine Elements.—This laboratory is about 23 feet wide and 90 feet long, and contains various machines for testing the friction of journals, the holding power of friction clutches, and for similar work connected with the elements of machines. There is also a belt-testing machine capable of testing pulleys eight feet in diameter, driving a belt as wide as 16 inches. The machine is driven by two 100 horse-power motors, which may run at any speed from 200 to 600 r.p.m. Rope pulleys, six feet in diameter, with four grooves, may also be tested on this machine.

The power applied to the belts is measured at the motor, and the power delivered, as well as other data relative to the working of the belt, obtained by suitable means at the driven end.

On this machine, in addition to the work on leather belts and various kinds of ropes, very valuable experiments on the steel driving bands now in use in Germany have been made, and with a machine of this size reliable information may be obtained on full-sized specimens instead of on the small models which must be used in most schools.

(d) Laboratory for Heating and Ventilation.—I regret that I have been unable to get any material description of this laboratory. The apparatus is very elaborate and complete, and a description is soon to be published. This laboratory is about 500 feet long and 20 feet wide, so that it is quite extensive.

(e) Hydraulic Laboratory.—This laboratory, which is illustrated here, is situated some distance from the other buildings, in order to bring it beside a natural stream of water. The stream in question is the Landwehr Canal, which is used by barges in the city of Berlin, and which joins the River Spree about a mile distant.



The Engine Laboratory—Berlin.

Adjacent to the hydraulic laboratory for the Technical High School is the large channel installed by the Government for making tests on ships' models, etc.

In almost all cases hydraulic laboratories situated on natural streams are smaller than those not so situated, because in the latter case a very considerable amount of room is occupied by the large pumping machinery required for the supply of water for turbines of the reaction type, and also because experimental artificial channels must be pro-