Departmental Notes

Professor H. L. Johnston, of the chemistry department, presented a lecture on heavy water Friday, March 28, to an audience of about 200 in the Chemistry Building. He explained that nearly all elements have isotopes. These isotopes have the same chemical properties but different masses, and also differ in most of their physical properties. However, it was only three years ago that Prof. Harold C. Urey, of Columbia University, announced the presence of an isotope of hydrogen, which element has generally been regarded as the building stone for all other elements. This isotope of hydrogen has an atomic weight of two instead of one for the ordinary hydrogen atom. The name of this isotope is "Deuterium" and the symbol is "D." A molecule of deuterium is D_2. The most important compound is D_2O or heavy water. Here the mass is twenty while that of ordinary water is eighteen.

There is only one molecule of heavy water to every 5,750 molecules of ordinary water. This can be concentrated by means of distillation or electrolysis until the D_2O is 99.9% pure but the cost is so great that there are only 20 or 30 pounds of heavy water, in concentrated form, in the world. About ten of these pounds are located at Ohio State University.

Professor Johnston supplemented his lecture with slides, showing methods of working with heavy water, and charts illustrating physical and biological differences between heavy and ordinary water. The concentration of heavy water in ordinary water depends somewhat on the source of the water. For instance, sea water contains slightly more heavy water than rain water; water from vegetable and animal sources generally has a higher percentage of D_2O.

In some of the limited tests performed to date, heavy water was found to speed up growth in some living organisms and to retard it in others. It is hoped that heavy water will be useful in medicine as a possible cure for cancer and other maladies. The study of isotopes in recent years has become quite important in the field of science. Great developments are expected in the next few years.

Chemical Engineering

A representative of a German Chemical Engineering and Equipment manufacturer recently visited the Chemical Engineering Department, Ohio State University, as a result of an endeavor to receive cooperation from the Department of Chemical Engineering on some chemical engineering investigation in the manufacture of hydrochloric acid.

The Department of Chemical Engineering under the direction of Dr. James R. Withrow, Chairman, carried on an investigation for two or three years in this same field with fusel silicate equipment. This was done for a British Equipment Manufacturer.

Dr. Withrow is cooperating with the University Y. M. C. A. in the 1935 series of Fireside Sessions. His choice of subjects is as follows:

1.—The Failure of Religion and Scholarship in the Problem as Self, as Persons, and as Nations.

2.—The Disaster to Character of the Hue and Cry Against the Accused, Against Wealth, Property and Office.

3.—The Ten Commandments, the Decalogue of Intelligence.

4.—The Disaster to Peace of Anti-War and Anti-Munitions Propaganda.

5.—The Success of the Christian Point of View as a Rule of Life.

Mechanical Engineering

A great deal of interest has been in evidence around Robinson Laboratory of late concerning the automotive test being run by four students, under the supervision of Professor Karl Stinson. The purpose of these tests is to determine the effects on motor compression and bearing lubrication produced by the use of Renite—oil containing finely powdered graphite. Brand new cars, loaned by several Columbus dealers, are used in making these tests. To date, tests have been made on Plymouths, Hudsons, De Sotos, and Chevrolets. The tests average from twenty four to thirty six hours of constant running, data being taken at hour intervals.

The cars are run onto a treadmill rack so that the engine can be turned over by a motor-dynamometer arrangement. Through control resistances the speed is kept very closely to a constant value. Conditions of temperature are ascertained by the use of numerous thermocouples placed at different points on the motor, and these are held to a small variance. Pressure gages in the spark-plug holes determine the compression within the cylinders, which is the criterion of the sealing qualities of the oil. Power consumption in turning over the motor is determined from the dynamometer and from this the frictional effects of the oil will be found. The work will not be completed until some time in May.

Ceramic Engineering

At the Annual Convention of the American Ceramic Society held in Buffalo, N. Y., February 18 to 23, about 120 alumni of the department were registered and 82 participated in an Ohio State dinner meeting.

The Fellows of the American Ceramic Society elected F. H. Riddle as Dean and Professor A. S. Watts as Junior Dean; both are O.S.U. alumni.

The demand for Ceramic Engineering graduates continues in very encouraging numbers. Since January 1, 1935, the following graduates have accepted new positions.

Ault, Alfred S., '31—Briggs Manufacturing Co., Detroit, Michigan

Baker, Julius, '33—Bonney-Floyd Steel Co., Columbus Ohio

Dorsey, Baird L., '34—Apollo Clay Products Corporation, Apollo, Pa.

Durbin, Edmund A., '34—Champion Spark Plug Co., Detroit, Michigan

Hemsteger, Samuel E., '23—Briggs Manufacturing Co., Detroit, Michigan

Larkin, Paul G., '15—Gladding Bros. Co., San Jose, California

McCaffery, Robt. E., '32—Westinghouse Electric and Mfg. Co., Mansfield, Ohio

Rudin, Chas. E., '31—Frigidaire Corporation, Dayton, Ohio

Sellers, John T., '31—Lawrence Clay Co., Jackson, Ohio

Trees, Jack E., '31—Detroit Vapor Stove Co., Detroit, Michigan

Whitmer, John D., '08—The Sparta Ceramic Company, East Sparta, Ohio

Yeagley, Wm. F., '33—American Rolling Mill Co., Ashland, Kentucky

Zehm, Robt. C., '21—Joseph Dixon Crucible Co., Jersey City, N. J.

Industrials Take Trip

Fifty Industrial Engineers under the supervision of Mr. Schneider of that department spent the quarterly vacation in Detroit and Dearborn. The group left Columbus on March 17 in a chartered bus and returned on the following Friday, March 22. Double rooms were reserved for the entire group at the Hotel Fort Shelby. The total cost averaged between $20 and $25 per student. The plants visited were: Ford-River Rouge Plant, Burroughs Adding Machine Co., Parke Davis, Packard Motor, General Motors Research, United States Rubber, Great Lake Steel, and the Plymouth Assembly Plant.

Mine Engineering

Mr. Lawrence T. Postle, a mine engineering graduate of Ohio State of 1929 is now mine superintendent of the Siscoe Gold Mines, Ltd., at Siscoe, Quebec. Prior to holding this position, Mr. Postle was employed for the Lake Shore Gold Mines, Ltd. for about four years. All his time since graduation has been spent in Canada.

On March 5, Mr. Postle talked to the Prospectors Club. In his talk, he told much about the Siscoe Gold Mines and of the community in which it is located. This mine is an island one mile square in the middle of Lake Duboison. Only 40 women inhabit the island, of which one is Mr. Postle's wife, also an Ohio State graduate. The island is accessible by boat and airplane in the summer and by airplane or across the ice in the winter. To fly airplanes during the winter in a temperature of 40° below zero is no ordinary procedure. The oil must be taken out of the engine and boiled while in the meantime a blow torch heat's the crankcase. The boiling oil is then poured back into the crankcase.

The mine produces about 400 tons of gold bearing ore per day. Each ton contains approximately $15 worth of gold. This hard rock gold mine reaches a depth of 1300 feet. The gold is very coarse, thus making recovery rather easy, although this factor may also be a temptation for the workmen to slip a few rocks in their pockets. Nevertheless, this place is free from the depression and the district possess some of the largest gold producing mines in Canada.

Cutting with Oxy-Acetylene

Oxy-acetylene cutting has developed from the mere severing process to processes where it is applicable to fabricating, finishing and shaping iron and steel materials. The process has predominant metallurgical aspects. It is no longer a problem to cut a given shape. The problem today is how to cut the various types of steel.

Oxy-acetylene cutting is grouped under two headings, flame-cutting and flame-machining. The first is concerned with the severing of various ferrous metals.

Flame-machining has been developed in the past two years. It is based upon the chemical reaction between iron and oxygen. It is not a cutting process but a removing process. A specified depth and width can be removed by applying the flame at an acute angle. Its application may be classed under five different headings: planing, milling, turning, drilling and boring.

Under planing may be classified deseaming, hogging and surface planing. Each has had considerable commercial value. The use of the flame for longitudinal fillet cutting and the sinking of regular planing cuts is known as flame milling. Screw threads and various cuts can be made by a proper adjustment of the oxygen flame. Drilling and boring have as yet not been commercialized.