

Engineer and Alumnus To be Released Soon

According to information received from Professor Finnegan, the March issue of the Armour Engineer and Alumnus will be out about the middle of March. This issue will see the establishing of two new departments.

Faculty Articles

The March issue will contain many articles of interest by men who are well-known in their fields. Of particular interest will be an article on traffic control by Professor S. M. Spears of the Armour civil department. Professor Spears has done a considerable amount of highly specialized work on a graduate level in this field. Other articles will be: "Research in Mathematics" by Dr. Rufus Oldenburger, and one on smoke abatement by Frank A. Chambers, chief of the Smoke Abatement Department of Chicago, who graduated from Armour in 1922. Articles will also appear on "Carburization of Iron" by Professor Swineford and "Engineering in Air Transportation" by W. C. Metzger, chief engineer of United Airlines.

The new departments will include a section devoted to literary criticism, written by Elder Olson of the English department and a column of interesting reflections called "I've Been Thinking Again" by Professor J. C. Peebles.

I. R. E. To Present Student Meeting At Central YMCA

Of a semi-technical nature, and of interest to men either in school or just out of school will be the student sessions of the Institute of Radio Engineers to be held monthly at Central Y.M.C.A. beginning sometime this month. Strictly speaking these will not be student sessions, but sessions presided over by men in the field and for the benefit of men just getting into the field. The following will be the nominal program: 6:15-7:00 dinner, 7:00 to 7:30 p.m. preliminary session (for the less experienced men), 7:30-7:45 p.m. discussion and question, 7:45 on papers of a more technical nature. Attendance at the dinner is not necessary. The men to present the papers have been chosen by Prof. Sear of our Electrical Engineering Department since he is the head of the Committee on Topics (papers, speakers and time assignments).

Tentatively the next meeting will be held in about two weeks when Mr. Crosley, private consultant engineer and representative of the "Q" meter manufacturers, will talk on "Measure of Resistance in Transmission Lines with the 'Q' Meter."

Concrete Lab In Sub-Chapin

For quite some time we have had a cement testing laboratory, but only recently this laboratory has come to the attention of the majority of the students.

Many years ago the cement testing lab was located in a small room in Chapin Hall. In 1917 the laboratory was moved to larger quarters in the basement of Machinery Hall. Now the lab has outgrown the space allotted to it in Machinery Hall, and recently it has been moved to the basement of Chapin.

The experiments done in this lab consist of the standard tests on cement and concrete. Starting next semester asphalt testing will be added. Some of the asphalt testing equipment has already been received by the institute.

SNOW CRUISER—

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chanic of the party. A radio station on the cruiser, under the guidance of Sergeant Felix Ferranto, is handling all communication for West Base because the West Base set is out of order. The Beechcraft airplane atop the cruiser has made two mapping and photographing flights thus far.

In all probability, the cruiser will stay at West Base until the end of March. Dr. Wade will remain in charge during this period.

Ford Gives Talk on Theory of Mapping To Graduate Division

Opening the spring series of public lectures last Friday, the Graduate School presented Doctor Lester R. Ford, who gave an interesting lecture on "Conformal Mapping and its Engineering Applications." Dr. Ford opened his lecture with a discussion of the Mercator system of mapping, the system of mapping that is used today in almost all popular maps and atlases. He stated that this system was "treacherous" in as much as it tried to do the impossible—the drawing of a spherical surface upon a plane surface. Any person who sews covers, made from flat sheets of leather, on spherical baseballs will testify as to the truth of this statement. Another form of mapping discussed was stereographic projection, which was used by Pappas (remembered by all who have labored through the calculus) as early as 150 B.C.

Explains Theory

After a preliminary explanation to the audience, Dr. Ford gave the simplest description of a Conformal Map as being one wherein every small unit retains its true shape. With this description in mind, the fundamental theorem of Conformal Mapping can be stated as follows: "... any plane region with a single boundary can be mapped conformally upon any other plane region." By this theory then, a map of a circular area can be made to perfectly fit a plane square, triangle or any other plane surface and still be a true Conformal Map. At first this may seem confusing, but further reasoning will show that it is true, that every small unit within the new map will still retain its true shape. To emphasize this point, Dr. Ford first drew a rough outline map of Chicago and then a human profile, asserting that with the proper equation the map of Chicago could be made to fit exactly into this profile.

Research Lab Has New Boiler

Perhaps the reader has noticed a new brick smokestack emerging from the old "Ice House" and what is now known as the Research Foundation Combustion Lab. A new boiler has been installed for the use of a new fuel oil, a colloidal product developed by the Foundation.

By placing it on a two foot brick foundation, the boiler is especially adapted to give an extensive and variable combustion chamber. According to Prof. Godwin, a Johnson oil burner is to be installed in conjunction with the boiler.

To Use Colloidal Fuel

To allow variation in the combustion chamber, the boiler was placed on a brick foundation two feet from the floor to give the opportunity of building with fire brick any size combustion chamber desired for experiments. A standard Crane 3-12 steam boiler was erected with a special adjustable firebox to allow variation colloidal fuel. This fuel is half coal-oil. One interesting feature of this plant is the ability of the experimenter to take colored and fast moving pictures of the combustion processes. This will be done by the use of three ports situated on one side of the brick foundation.

By the use of this boiler, the Research Foundation will be able to predict the efficiency of their oil when burned in different size plants after the oil has been marketed.

S.A.M.—

(Continued from page one)

and uncooperative spirit of many government employees. In these troubled times the government must show reason for its existence. If it is to endure it must have a firm foundation. It must not only guarantee "life, liberty and the pursuit of happiness," but it must go beyond the limits of the Constitution and insure the proletariat an equal right in business enterprises. The turbulent belligerent nations in Europe were thrown in a chaotic condition primarily because they had no firm basis for existence. Confronted with the enigmas of racial prejudices, religious persecution and avariciousness, the nations flung themselves against each other like a lion leaping for its prey. To prevent the perilous conditions prevalent in Europe, it is imperative that government employees offer their utmost in service and co-operative spirit there by engendering a nation comparable to a modern Utopia.

Faculty Members Attend Convention Of Concrete Men

Several members of the faculty of the department of civil engineering recently attended the 36th Annual Convention of the American Concrete Institute. This convention was sponsored by the Portland Cement Association and other prominent manufacturers in the cement and concrete industry. The purpose of the institute is to promote the use and application of cement and concrete.

Dr. Grinter Speaks

This year the convention was held at the Palmer House Feb. 27-29. Vice-president Linton E. Grinter of Armour was one of the men who presented material on concrete research. His speech was entitled *Long-Time Laboratory Tests of Concrete Floor Panels*. Dr. Grinter summarized the experiences of our laboratories during the last few years, and the results obtained by them.

Among the topics taken up during the convention were: simplification of concrete-mix design, frost resistant concrete, tolerances in building construction, and proposed revisions of the "Building Regulations for Reinforced Concrete."

Dr. William A. Pearl Holds Welding Class

Looking through the school catalog, one might come across a course labeled M.E. 511 N. This title is not very descriptive, but it refers to the post-graduate welding class that Doctor Pearl conducts in the night-school division.

The course consists of lectures with demonstrations of welding and covers the behavior of metals and alloys, both ferrous and non-ferrous, at high temperatures. During the first semester, Doctor Pearl expounds the general methods of welding in theory and in practice.

In the second semester, M.E. 512 N., each student is given an individual welding problem, which includes the welding of certain alloys and the preparation of a report describing the methods and technique used to make a successful weld. The report and the weld are submitted together, and the grade for the second semester is almost entirely determined by them.

Bruce Longtin Presents New Thermo Theory

A scientific contribution of primary importance, dealing with rates of change has been recently announced by Dr. Bruce Longtin, instructor in graduate physical chemistry and thermodynamics. At a recent Thursday seminar in thermodynamics, Dr. Longtin discussed results of extended studies of phenomena involving problems of rate of change undertaken in an attempt to give a mathematical formulation to a very common assumption, the principle that in any flowing system or flow of streams, the streams tend to follow the path of least resistance.

Conversion Explained

His research has resulted in a general unified method of studying all problems of the rate of conversion of energy from one form to another. It emphasizes the fact that all rate phenomena are examples of a single phenomenon, the rate of transformation of energy from one form to another. Thus a reason is given for what previously appeared to be only formal analogies between the rate laws for different types of flow.

The most important aspect of his presentation is the recognition that the principle could be made a harmonious part of the subject of thermodynamics. Professor Max Jakob, international authority on thermodynamics, said, "Dr. Longtin has developed a unified formulation for the evaluation of equalization processes. The method is general and seems to be original."

"We know," said Dr. Longtin, "that in any flowing system or flow of streams, the streams tend to distribute themselves so as to minimize the conditions of resistance which they must encounter. A function which represents the extent of interaction between streams and the ob-

VIVIAN BOSWELL, operator at the busy switchboard of Chicago's Stevens Hotel, largest in the world, takes time out to enjoy a Chesterfield.

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stacles or resistances is what is sought for by this study. The function should have a smallest value when the stream distributes itself in the manner actually observed during experiments concerning that particular stream flow."

New Method

J. Onsager, working along somewhat similar lines, gave, in 1932, a satisfactory mathematical expression of the function, for certain cases. On this basis Onsager set up a number of expressions for special forms of the function, which have led to some interesting results, such as the theory of diffusion and conductivity of electrolytes. Quite independently, Dr. Longtin has developed the general formulation by using thermodynamic methods.

"For any flowing system there exists a function whose general formulation we give by the expression:

$$F(\Phi - r_s)$$

where Φ depends on the rates of flow and reaction and designates in-

teraction between streams and resistances due to relative motion; r_s is the rate of generation or creation of entropy, and $-r_s$ represents the rate at which the streams are building up potential barriers. There are two general types of obstacle: frictional resistance and potential barriers. The value of r_s can be expressed by ordinary thermodynamic methods in terms of quantities which we already know how to measure.

Forms Presumed

"We do not pretend to give the function any a priori mathematical form, but simply to determine its value experimentally. I have set up," said Dr. Longtin, "some forms that the function might be presumed to take, in order to see what results that leads to."

He then showed how some simple substitutions in the general expression would give Ohm's law of electrical conductivity; Fourier's law of heat transfer; Fick's law of diffusion; Poiseuille's law of fluid flow;

the laws of non-linear conductors such as in vacuum tubes, certain types of lightning arrestors, and certain types of rectifiers; and the Soret effect in which the flow of heat establishes gradients of the concentrations of the various chemical components, to mention only a comparatively few examples.

Evaluation Simpler

The complete statement of Dr. Longtin's principle appears to be a special form of the principle of least action which forms the basis of classical mechanics. Onsager has shown a historical relation between the two. On this basis it is possible to obtain expressions for the interaction from molecular-kinetic theory and statistical mechanics. The evaluation of Dr. Longtin's function appears to be much simpler than other methods of applying statistical mechanics to rate problems, allowing the getting of workable results by applying statistical mechanics to cases that are too difficult to handle otherwise.