

PROFESSORS WEINER AND STRUIK EXPLAIN THEORY SET FORTH BY EINSTEIN

RELATION BETWEEN GRAVITATION AND RELATIVITY SHOWN

Work Of Scientists In Regard To New Theory Explained For The Layman

NEW GEOMETRY NECESSARY

Since the publication of the latest theory of Albert Einstein a few weeks ago considerable interest has been aroused as to just what it is all about. Professors Norbert Wiener and Dirk J. Struik of the Institute have written the following article in an effort to show the students of Technology what this amazing paper means. The writers were of course limited in their explanation as they endeavored to use only the simplest language that the students might more easily understand the complex problems involved. "In 1916, when Einstein published his theory of gravitation (the so called general theory of relativity) he succeeded in assigning to the mysterious force of gravitation a well defined place in natural science. Gravitation, according to him, is nothing more than an apparent force, just as centripetal force and the force of Coriolis in the old mechanics, so that it depended only on the system of reference. Everyone who has ever solved a problem in mechanics knows what this means. If, for instance, a heavy mass moves in a tube rotating around an axis, the problem can be solved either by introducing a fixed axis and considering gravitation as the only working force, or by introducing a moving axis and also additional so called apparent forces, namely centripetal force and force of Coriolis. Einstein's idea was to extend this notion of gravitation itself and he succeeded in 1916.

New Geometry Introduced

"For this purpose Einstein introduced a special type of geometry departing from Euclid and inseparable from gravitation. He thus succeeded in unifying two parts of science that were previously separated, geometry and mechanics. Two great subdivisions of natural science were unaccounted for, electro-dynamics and quantum theory. He was, however, able to show, in the same paper, that it was possible to have electro-dynamics in his world. The connection between gravitation and electro-dynamics was still very loose. Electrical forces remained real forces and quantum phenomena were entirely out of the reach of his theory.

"In 1916 a new series of speculations was started by Herman Weyl, the famous Zurich mathematician who now is a guest of Princeton. Weyl succeeded in setting up a theory which brought geometry, gravitation, and electro-dynamics under one unifying principle. Now, also electrical and mechanical forces became apparent forces. He did this by a slight modification of the geometry underlying Einstein's original theory. In fact, once you drop the geometry of Euclid, you may assume whatever type of geometry you please if the results really yield Newton's laws and

SENIORS

Representatives of the company by whom the senior rings will be made will be in the Main Lobby on February 12 and 13 to exhibit and take orders for the rings for the class of 1929. There are several types and a selection is to be made by each senior individually. The total cost of the ring will be between \$10 and \$11 depending upon the type chosen. An initial payment of \$5 is required when the ring is ordered and the balance is to be paid when the rings are finished. It is expected that ordered rings will be delivered by the end of March.

English Honors Option Restored

Prof. Seaver and Prof. Roberts to Tutor Two Groups of Ten Men Each

In addition to the regular English course and the literary option, an "Honors Option" in Sophomore English has been inaugurated this term. This option was started last year but was suspended the first term of this year in order to insure a more careful choice of the option groups.

This year the option consists of two groups of ten men each, chosen from those who would like to work under the tutorial system. In addition to having good grades in freshman English, the men must be interested in making an intensive study in some cultural field. The subject chosen however must be outside of the field covered by other departments at the Institute, and may include literature, history, music, philosophy, and the fine arts.

Men in the option are expected to select some specific topic for study, involving both a large amount of reading for background and some specialization to be carried out under an instructor who will act as a tutor at weekly conferences. Exemption from regular class work is one of the features of the course.

Professor Henry L. Seaver and Professor Penfield Roberts are in charge of the option groups this year. Those who have been admitted into the two groups are Herbert W. Chandler, Jeremiah F. Cook, Harold J. Davis, James R. Day, Harold A. Freeman, Oscar G. Goodhand, John N. Higgins, Frederic W. Nordsiek, John A. Shute, Alfred Ziegler, Roy W. Chamberlain, Emilio G. Collado, Hymen R. Davis, Jacob Bordon, Harold D. Gurney, Helge Holst, Charles G. Martin, Jr., Eugene Roger, William B. Schneider, Jr., Stuart C. Westerfeld. All these men are class of '31.

AERO EXPERT SPEAKS ON AVIATION LIMITS

Faculty Club Hears Talk by Mr. Bruce G. Leighton

"The Present Limits of Aviation" was the subject of a lecture given by Mr. Bruce G. Leighton before a luncheon meeting of the Faculty Club in the Faculty Dining Room, last Wednesday noon.

Mr. Leighton was formerly a Lieutenant Commander in the United States Navy Bureau of Aeronautics, where he had charge of the division of aviation engines. He contributed toward the development of the modern aircooled engine used in naval aircraft, and did much to bring the naval aviation service to the high standard of efficiency which it has attained. He is now employed with the Wright Aeronautical Corporation.

Mr. Leighton believes that the greatest obstacle to the development of the airplane is the inability to carry great weights. He states that up to the present time the greatest loads which airplanes have been able to carry is somewhat less than 25 pounds per unit of horsepower. He believes that if planes can be made practically which will carry greater loads, they will be very extensively used as vehicles of transportation.

Mr. Leighton also spoke of the phenomenal rise of aviation during recent years. He recalled that in 1903 it was almost impossible to procure an engine light enough for airplane use. Most of the development of planes has come since that time, the greater part during the last fifteen years.

In discussing the safety of air travel, Mr. Leighton quoted figures to show that the passenger per mile fatality rate over the well-managed transport routes compares very favorably with that of other means of transportation. The chief value of aviation is the fact that it is a time saver.

Club-Wielding Soph Corners Peeping Tom

Armed with a club and backed by another person with a hammer, Stanley J. Szymczyk '31, played the leading role in capturing a Cambridge "Peeping Tom" last Wednesday night at his boarding house on Magazine Street. For several nights the residents in the neighborhood had been annoyed by the actions of the interloper and now that he has been lodged behind prison bars the weaker sex can breathe more freely again.

When the police answered the hasty summons and arrived at the scene of action they found Szymczyk and another occupant of the house holding the intruder at bay in a corner and daring him to try to get away. After the "Peeping Tom" had been taken away in the paddy-wagon the two captors told the police that their suspicions had been aroused several nights before by the queer actions of a man who was prowling around the neighborhood. They determined to "lay for" the man an accordingly they hid behind some bushes on Wednesday night and caught the household menace in the act of peeping through a window.

Clubs Entertain Girls at Salem Normal Tonight

Program to Follow Dinner Given by Students—Dancing After Concert

Girl students of the Salem Normal School will give a joint program of music and entertainment with the Glee Club, the Instrumental Club, and the Tectonians tonight. The concert will follow a dinner given by the girls, each Club member who attends being assigned a partner in advance. For this reason it is important that the Clubs management know in advance how many men are to attend.

A xylophone solo by Gardner Harvey '32, accompanied by Thomas DeMarco '30, is to be the feature act of the evening. Several selections will be rendered by each of the Clubs, and the Tectonians will furnish music for the dancing which is to follow the concert.

Transportation will be furnished by busses, which will be ready in front of Walker Memorial at 4.45 o'clock and will leave promptly at 5. Club members are urged to arrive on time, and are reminded that it is essential that all members wear their Club ribbons to this affair.

TOTAL PAYMENT FOR PROM DUE IN 11 DAYS

Juniors to Get First Choice in Table Reservations

Redemption of signups for the Junior Prom will be held on Thursday and Friday of next week, February 14 and 15, and Monday and Tuesday of the week following, February 18 and 19. At this time those who signified their intention of going to the Prom must pay the remainder of the total cost of \$15.

Thursday, February 14, will be reserved exclusively for Juniors thus giving them the preference in the table reservations which will be assigned at redemption. This is the only part of the Prom in which Juniors are given any preference over the other classes.

Over 150 signups were received in the three days campaign that closed on Wednesday. This should not be taken as an indication of the number that will attend the Prom however as 275 were present at the Prom last year in comparison to the 125 signups. The attendance at the ball is usually more than double the number of those that signified their intention of coming during the signups. Those who did not purchase tickets during the campaign just closed may attend the Prom by paying the full cost of \$15 at redemption.

PROF. CHATFIELD TELLS WHY AIRPLANES FLY IN POPULAR SCIENCE TALK

German Scientist To Give Lectures

Professor Rudenberg, Guest of Institute, Will Discuss Earth Currents

Professor Reinhold Rudenberg, Chief Electrical Engineer of the Siemens-Schukert Works in Berlin, and Honorary Professor of Electrical Engineering at the Technische Hochschule in Charlottenburg, is now a guest of the Institute. During his stay here he is giving a series of lectures which began on February 4 and will continue till February 26.

Among the subjects Professor Rudenberg is discussing are problems of earth-currents and interference, traveling waves on transmission lines, and transmission of power over great distances. Each lecture of the series will be given in Room 10-275 at three o'clock. Because of the lecturer's prominence the addresses will be open to practicing engineers who may wish to attend.

So that his stay at the Institute may be more pleasant and in order that Professor Rudenberg may be more easily reached by men wishing to discuss problems with him Room 4-210 has been assigned to him. Beside gaining stimulus from these lectures, the professors are also availing themselves of this opportunity to have informal conferences and chats with Professor Rudenberg upon subjects of their own particular interest such as research problems and the like with which work is being done at the time of his residence here, and in which mutual interchange of ideas may prove of considerable benefit to us as well as interest to him.

These lectures are being given on Tuesday, Wednesday, and Friday afternoons and the subjects of the individual lectures will be posted on the bulletin boards about the Institute.

SERIES OF LECTURES SPONSORED BY T.C.A.

International Institute to be Held Here this Month

As the result of negotiations made by the T. C. A., an International Institute will be held at Technology on February 25, 26, and 27. The purpose of these gatherings, which have already been held by several New England colleges, is to inform the students regarding important international questions, by means of lectures and discussion groups.

Lectures will be held on each of the three days in Room 10-250 during the day, in the dormitories and some of the fraternities at night, and in several of the regular classes. The names of the lecturers have not yet been made public, but will be announced in a future issue of THE TECH.

The general committee in charge of this event at Technology is headed by William J. Harris '29, Manager of the Meetings Department of the T. C. A. The Liberal Club and the various foreign clubs have assisted in the work.

SEVEN HUNDRED SIGN UP FOR "TECHNIQUE"

Today and tomorrow are the last two days of the signup campaign for the 1929 Technique at the reduced rate of one dollar. Under no conditions will the campaign be continued after Saturday, February 9. This year there are an unusually large number of students waiting till the last minute and they are warned that the cost of a signup will be two dollars after Saturday.

The signups for the 1929 copy of Technique sold to date amount to 700. This number is below last year's sales for the same period. This year's Technique will contain among its new features pictures of the entire instructing staff. As usual it will have pages devoted to every phase of undergraduate activity, including the Junior Prom, Field Day, athletic contests, and fraternity and dormitory life.

THIRD ADDRESS OF SERIES FEATURED BY EXPERIMENTS

Capacity Attendance Expected At Lectures Today, Saturday and Sunday

ALL SEATS TAKEN SUNDAY

Professor Charles H. Chatfield of the department of Aeronautical Engineering will be the speaker at the third Society of Arts Popular Science Lecture to be given this year. He will speak on "Why an Airplane Flies" in Room 10-250, today and Sunday at 2:30 o'clock and on Saturday at 4 o'clock. High school students are invited to the lectures today and Saturday and the general public on Sunday.

First Professor Chatfield will show the principal parts of the airplane with slides. Newton's Law of Motion as applied to a solid body, a stream of solid bodies, a liquid, and a gas will be demonstrated by experiments. By means of a ball held above a long glass tube by a stream of air Professor Chatfield will try to give the audience an idea of relativity. The nature of the airflow around a body will be shown on the wall reflected from a glass walled container with colored water flowing around a solid.

Professor Chatfield will demonstrate the air forces on an airfoil by means of an open wind-tunnel. A wing section will be held in the air stream from a fan and the lift and drag on the airfoil will be shown on scales. The effect of a flap on the wing will also be shown in this experiment.

The resemblance of a propeller to a simple airfoil will be made clear to the audience by means of an apparatus consisting of a propeller mounted on a car running on a track. The thrust of the propeller pulls the car to the limit of a spring and when a stream of air is blown on the propeller the car moves back until equilibrium is again established.

Professor Chatfield will then put an airfoil without control surfaces in the wind stream from the fan and show that it is unstable. The effect of adding control surfaces will be shown. Finally an airplane model will be put in the open wind tunnel and the controls will be moved to show how the plane responds to the changes.

After the lectures anyone interested will be shown through the Daniel Guggenheim Aeronautical Laboratory. The large wind tunnel will be in operation and airplanes in the museum may be examined.

Candidates Wanted for Positions on THE TECH

Several men have already entered into the competition now being conducted by THE TECH for staff positions in the various departments of the paper. However, more candidates are needed and those who come out have their choice of working in the news, features, sports and business departments.

At the same time a competition, open to sophomores, is being held for the office of Features Editor. Any sophomore, whether he has had previous newspaper experience or not is eligible to enter this competition. In addition those students interested in photography are urged to come out as staff photographer candidates. The drive for new men will end on Wednesday, February 13, at which time a smoker will be held in Walker Memorial for all candidates and staff members.