SEMINAR WEEK-END

ALUMNI GATHER FOR SOCIAL-EDUCATIONAL EVENT

THE SEMINARS IN RETROSPECT

By H. FRED PETERSON, '27,
Publicity Chairman of the Committee

The Second Annual Seminar Week-end of the Alumni Association is history, and as such has more than repeated the success achieved by the first Seminar a year ago. The sincere delight with which Alumni attended the series of events organized for their benefit was expressed on all sides. The only regrets which were uttered were that individuals were not divisible cells which would have permitted attendance at more than one lecture simultaneously.

For many years the idea has occurred and re-occurred in the minds of the members of the various Boards of Directors of the Alumni Association that some form of Alumni education should be developed. Last year the seed took root and under the efficient and meticulous care of Clarence F. Kiech, '26, the Seminar week-end sprang into being, a full-grown healthy institution with a definite purpose to fulfill. This year, with the precedent of a successful Seminar as a guide, an attendance of some 530 Alumni and guests enjoyed a program of exceptional interest and merit.

The ideals and policies so carefully outlined by Kiech were carried on with enthusiasm by Ted C. Coleman, '26, in managing the Second Seminar. The continuance of the co-operative spirit between Faculty and Alumni contributed again to the spontaneous feeling of goodwill and fellowship with which the speakers addressed their appreciative audiences. Coleman carried on and amplified all the original tenets of the Seminar, particularly that which provided that the Alumni themselves were to choose the subjects and the speakers, assuring a combination of cultural, scientific and technical topics which would be of intense interest to all Alumni. In this principle, Dr. Robert A. Millikan and his entire staff cooperated willingly and completely and earned the sincere appreciation of all who attended.

It was with distinct pleasure that Alumni were shown that the various Faculty members participating in the Seminar so obviously enjoyed greeting their former pupils. From the many remarks made it seems that Prof. George R. MacMinn may have expressed the views of all the Faculty when he said at the close of the Humanities Seminar, "We are happy to have you come back . . . it is an inspiration and does us a tremendous amount of good."

The luncheon arrangements were excellent and the Alumni owe much to the efficient management of the Student Houses. A record crowd of over 300 were fed a first-class meal in time to appear on the front steps of Throop Hall for a group picture prior to the afternoon session.

The registration of around 450 men was accomplished in an hour and a half by the efficient staff organized by Loys Griswold, '25. No confusion existed and it was a pleasure to witness the cheerful feeling of friendship prevailing throughout Dabney Hall as the men streamed in to acquaint themselves with the details of the plans made for their enjoyment. Harold C. Hill, '11, as official greeter, lent valuable assistance in steering Alumni and their guests to the proper rooms for registration.

Kinsey congratulates Coleman.

After absorbing quantities of weighty and thought-provoking ideas all day Saturday, some 250 found it delightful to adjourn to the Annandale Country Club and relax amid refreshments prior to dinner. Dr. Millikan made many an Alumnus aware of the passage of the years as he twitted them with "looking for all the world like a group of bank directors . . . with thinning hair and receding foreheads . . . and expanding girths." However, his words of genuine welcome to Alumni more than offset the nostalgic memories of the abundant hair and slim waists of undergraduate days.

"We are never to old to learn" might easily be accepted as the theme of the Alumni Seminar. The eagerness of Tech men to absorb once more the teachings of our Alma Mater, to sit again at the feet of our old Masters and to listen to the words of the newcomers on the Campus is an inspiration. All those who gave of their time and energies to make the Second Annual Seminar the smashing success that it was, certainly have felt repaid a thousand times for their labors. And if the prolonged, enthusiastic applause given to the speakers at the conclusion of their talks was not an indication of the appreciation and gratitude of the audiences, let these

few words sum up the heart felt thanks to the Faculty of Caltech that every Alumnus feels for a stimulating feast of ideas and learning. Four big rousing cheers for Dr. Millikan and his entire staff, and au revoir until 1940.

EDITOR'S NOTE: In order to provide a brief of the Seminar transactions for those who were unable to attend, and a record for those who did attend, the following reports are furnished. The willingness and effort of the men who undertook these reports is much appreciated.

T

"What Is Unique About The California Institute of Technology?"

PROF. WILLIAM B. MUNRO

Reported by GEORGE RICE, III, '31

Following a welcome by Ted Coleman, chairman of the Seminar, Ed Kinsey introduced Prof Munro who spoke to a throng which taxed the capacity of Culbertson Hall.

Speaking on unique phases of the Institute's ideals, Prof. William Bennett Munro reminded us that admittance of freshmen is only by examination — with room for only about one-third of those who pass the tests. This "selection" eliminates many of the disciplinary measures necessary in most colleges.

Using new facilities "to do the present job better" rather than expanding classes and curriculum, or running extension courses or outside activities, is an important aim at the Institute. Another unique feature is the inclusion of humanities subjects in the first five years of technical courses for more than one-fourth of the student's work and the broad basis of general science in undergraduate courses to make for more flexibly-trained men. Finally, Prof Munro differentiated between classwork conducted as a "sight-seeing tour" and that at the Institute on an "exploration party" basis, which instills the spirit of research into the undergraduates.

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"Three Dimensional Weather Forecasting"

PROF. IRVIN P. KRICK

Reported by KARL E. HEGARDT, '32

One of the largest groups of the Seminar week-end met in Culbertson Hall to hear a very interesting illustrated lecture on the latest methods of weather forecasting.

Dr. Krick showed slides to illustrate his theory and also motion pictures of cloud formations speeded up to many times normal. One unusual shot showed clouds forming out of a clear sky over the Sierra Nevada Mountains due to the rapid ascent of a moist air mass with resultant expansion of air condensation of moisture. An illustrated explanation of the New Year's flood of several years ago was also presented.

This new method of weather forecasting is based upon a knowledge of the direction and speed of movement of the different types of air masses which are constantly migrating over the earth's surface. In order to obtain these data, simultaneous observations of barometric pressure, humidity, temperature, and prevailing air movements are taken at many observation points and at various altitudes. During stormy weather when airplanes are grounded, the information is obtained by sending up small balloons equipped with radio transmitters which automatically relay observational data to ground instruments. This information is then used to study the movements and types of air masses, and on this analysis the forecast is predicted.

The methods of long-range forecasting were described by Dr. Krick in the December, '38, Alumni Review, hence are not repeated here.

T

"Chemical Experiments in Petroleum"

PROF. WILLIAM N. LACEY

Reported by FREDERICK S. SCOTT, '30

Dr. William N. Lacey, professor of Chemical Engineering, discussed the relation of the Institute to the petroleum industry, pointing out that this industry is the largest single employer of Tech men and that graduates, particularly in the chemical and mechanical engineering fields, gravitate to the oil companies. It was shown that the Institute cooperates with the petroleum industry in many research projects notable in such fields as thermodynamic properties of hydrocarbons, organic chemical research, asphalt corrosion protection, study of metals used in the industry and the like. The industry cooperates with the Institute in supporting this type of research, in offering summer johs to undergraduates, and in accepting as adequate the type of fundamental scientific and engineering training which has been adopted as a policy in the Institute's educational program.

T

"Hormones and Vitamins in Plants"

DR. JOHANNES VAN OVERBEEK

Reported by WILLIAM T. TAYLOR, '22

Biological engineering is so new a branch of engineering that the Tech alumnus of five years standing has hardly even heard of it, yet Dr. Johannes Van Overbeek's lecture on "Hormones and Vitamins in Plants" gave a glimpse of the plant side of this new science.

Hormones, those chemicals produced in minute quantities (in the order of fifty parts in a billion) by plants and circulated in the plant structure, have a profound effect on plant growth. Take a growing erect plant, bend it to one side, and the new growth will start in the vertical once more. This phenomenon is now known to result from the unequal concentration, due to gravity, of hormones in the inclined portion of the plant.

Auxin, a hormone, stimulates root production. Replanting of eroded areas is expedited by dipping cuttings of shrubs or trees in auxin, driving them into eroded slopes while they are moist; the cuttings take root, the plant grows, and erosion is checked.

Root growth is started by hormones but continued growth is stimulated by vitamins, especially B_1. Indications now are that best results are obtained by starting rooting with auxin, then plant stimulation with vitamins B_1 and Nicontinic acid.

Vitamins are produced in plants in widely varying concentrations (average about 100 times hormone concentration). Slow growing plants, i.e., camellias, orchids, etc., have few vitamins. Experiments show normal rate of growth can be speeded by feeding vitamins.

Valuable discoveries have been made during the ten years since this research project was started but most important, only now are we beginning to know of the mysteries of plant growth and the enormous scope of the research.

For those who want to know more, see the book "Phytohormones" by Went and Thimann.

— T —

"Germany and The European Situation"

PROF. J. E. WALLACE STERLING

Reported by BEN BENIOFF, '22

In a lecture packed full of interest, Professor J. E. Wallace Sterling presented a picture of central and south-eastern Europe that attracted more than passing interest. He started out by relating the historical background of the present "Greater Germany" movement, which is in fact one hundred and twenty-five years old. Except for a brief interlude during the regime of Bismarck, the Iron Chancellor, this Pan-Germanic idea has been the goal of the German ruling party. Bismarck acted somewhat as a "break" to this movement, through advocating a strong, self-sufficient, "Small Germany."

With this interlude, the situation with rapidly changing aspects, was brought right up to the present. The loss of the World War by Germany merely postponed the inevitable. Hitler as the master of Europe holds the peace of the world in the palm of his hand. His next move is always unpredictable. One thing, however, stands out: his word means nothing, his promises and treaties are made merely to be broken. Should he stop now, peace will remain for a while but if, as some predict, his appetite has merely been whetted, then almost anything can happen as borne out by current news reports.

Electrical Seminar

Reported by M. W. EDWARDS, '26

Professor R. W. Sorensen, assisted by Dr. MacKeown, discussed the trend of electrical engineering education starting with the early days of the arc light and multiple lighting systems. Engineering was mostly cut-and-try until 1905 when complex quantities began to creep into electrical calculations.

The first long transmission lines were caluculated by use of complex quantities and it was not until 1915 that hyperbolic equations were adopted for this work. Little or no change in calculation methods were noted for the next fifteen years. In 1930 operational calculus was applied to solving transient problems and symmetrical components were advocated in place of complex quantities.

By means of symmetrical components, any unbalanced three phase system consisting of three vectors can be resolved into three sets of balanced vectors, that is, positive sequence, negative sequence and zero sequence.

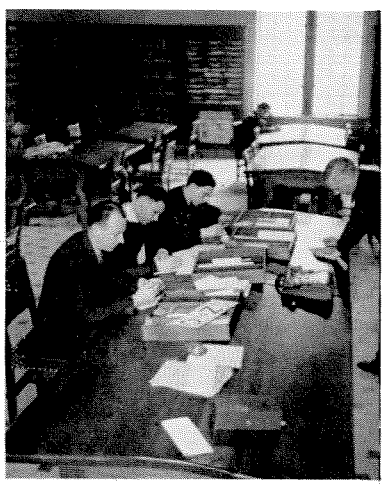
Lately, tensors have been creeping into our engineering calculations. Tensors greatly simplify the solving of network problems where a great mass of calculations have to be made.

In the future, engineering graduates will need five years of college with more courses in physics and mathematics.

In expressing views on the question of "Public vs. Private Ownership" Professor Sorensen said that in a professional way the engineer should not take sides, but, as a citizen, one should feel free to express his views openly in an economic way.

Dr. MacKeown discussed the improved efficiency of fluorescent lighting. Fluorescent lighting is about three times as efficient as incandescent lighting because the ultra violet light, normally not seen, is made visible by using fluorescent materials inside inert gas filled tubes. Also laboratory experiments in the generation and transmission of ultra high frequencies of wave-lengths less than one meter were discussed. Such methods may eventually be used for television and high frequency power transmission.

(Continued on page 12)



A Quest for Knowledge — A Splendid Reunion — Profitable Memories in the Making.

SEMINAR WEEK-END

(Continued from page 5)

"Investigating Earthquakes"

DR. C. F. RICHTER

Reported by HARRY MASON, '30

In 1921 the Carnegie Foundation set up funds for a seismological laboratory for the Southern California area. In 1923 the present building on San Rafael Avenue just west of the Arroyo Seco was completed. From that time until the end of 1936 the laboratory was operated by the Carnegie Foundation in conjunction with the California Institute. Since 1937 the laboratory and staff have operated as a part of the Department of the Geological Sciences at the Institute.

Earthquake investigations consist essentially of cataloging local quakes and locating their epicenters and also cataloging distant quakes through cooperation with foreign stations.

Earthquake waves are of two types, longitudinal and transverse. By a determination of the difference between the two waves the seismologist is able to obtain the distance from the point of recording to the center of the quake. The most intense and frequent disturbances seem to border the Pacific Ocean. It has been thought for many years that seismic disturbances occur only to a depth of about 50 kilometers down into the earth's crust but it has recently been demonstrated by Dr. Turner of England that they occur as deep as 500 kilometers, particularly in the South Pacific and South America and also in the Japanese Island group.

Dr. Richter concluded his remarks by stating that the recurrence of earthquakes in any area previously shaken is as sure as next winter's rain, but the time of recurrence is as yet unpredictable.

The energy in a strong shake is 10^8 to 10^{17} ergs.

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Chemistry Seminar

Reported by FREDERICK S. SCOTT, '30

Under the chairmanship of Prof. Linus Pauling the chemistry group was appraised of the latest developments in Chemical Research at the Institute. Prof. Swift reviewed his new system of qualitative and semi-quantitative chemical analysis which has recently been published and has received favorable reception in both industrial and institutional chemical laboratories. The new developments in separation and determination of the various anion constituents was described in some detail.

Prof. Lucas discussed the recent work on the Walden Inversion with particular reference to organic coordination complexes. Particular emphasis was placed on recent developments at the Institute relative to the optical activity of butane derivatives.

An experimental demonstration of the chromatographic analysis methods was given by Dr. Winstein who pointed out the wide spread industrial applicability of this type of separation. The method consists essentially of depositing various fractions of a complex mixture of organic materials on a filter bed, by varying the solvent power of the solvents employed in the filtering operation.

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"New Experiments in Nuclear Physics"

DR. WILLIAM A. FOWLER

Reported by ERNST MAAG, '26

Dr. Fowler first showed in what ways the nuclear system is different than either the atomic system or the solar system and because of these differences the new approach needed for investigations.

He also pointed out that because of the size of the particles involved they could only be studied by breaking down the system by exitation of its parts and studying their effect on other observable particles. The methods used make the system unstable through addition of energy by radioactive substances, cyclotron, transformers and condensers, or by electrostatic generators. Dr. Fowler used many slides to illustrate the equipment for these methods.

The particles given off are made observable by an electric counter or by a cloud chamber. In the cloud chamber each particle, for instance an electron, positron or alpha ray makes a distinctive path by the collection of mist on the ionized gas that it leaves in its wake. By a study of such paths in magnetic fields as well as out, much is learned about the particles.

Many interesting slides of tracks in the cloud chamber were shown. Dr. Fowler also conducted experiments with both the electric counter and cloud chamber showing how they work.

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PROF. MAX MASON

The keynote of Dr. Mason's profound yet entertaining discourse was, as he describes it, a study which dwarfs all others through its importance — the application of pure science to the biological and neurological makeup of individuals. He maintains that the role of science in the problem of human behavior not only opens new frontiers of learning but will ultimately be the point of differentiation between successful conduct of individual or collective human affairs and an unsound or chaotic structure of mankind.

Dr. Mason is chairman of the Observatory Council and member of the Executive Council of the Institute. He was president of the University of Chicago, 1925-1928, and has been president of the Rockefeller Foundation from 1928 through 1938.

EDITOR'S NOTE: It is regretted that space does not permit reports on several seminars which were among the most interesting of all. Copy is being held for the next issue.