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SIGMA XI LECTURE DELIVERED BY DR. LIVINGSTON FARRAND

PHILADELPHIA CONCERT BROADCASTED BY RADIO

Evening Appearance at New Century Club Draws 500 Persons

AT SCHENECTADY TONIGHT

PHILADELPHIA, December 29.—The Combined Musical Clubs of the Institute gave the second concert of their winter trip at the New Century Club House of Philadelphia, last night before an audience of over 500 people. The performances of the clubs were received with great appreciation as was indicated by the hearty applause with which each number of the program was rewarded. The clubs' specialty acts were particularly well received, commanding such tremendous applause that many encores were given.

The Philadelphia concert was sponsored by the Alumni Association of Pennsylvania. Members of the association residing in Philadelphia entertained the visiting clubs at dinner.

In the afternoon many of the numbers of the concert were broadcasted from the radio station of the Strawbridge and Clothiers' store. Following the broadcasts many radio calls congratulating the clubs were received.

Tonight's concert will be at Schenectady, N. Y., and will be in charge of E. D. Harrington '18. The other concerts of the trip will be at Buffalo, and Utica, and possibly at Holyoke and Pittsfield. The Jazz Band will be broadcasted from Station WGY at Schenectady about 4 o'clock this afternoon.

A. J. Browning '22, former General Manager of THE TECH, will be in charge of the concert at Buffalo tomorrow night. This concert will be held at the Twentieth Century Clubhouse and will be followed by a dance lasting until 2 o'clock. The Clubs will lunch with Mrs. A. B. Potter tomorrow noon. At 4 o'clock several specialty acts will be broadcasted. The members of the Musical Clubs will be dined by the Alumni of Buffalo.

DESCRIBES NATURE'S PART RESPECTING BUGS

Dr. Parshley Explains How Problem of Flight Is Solved

How nature, in the course of evolution, has solved the problem of flight adaptation in waterbugs, by giving to some individuals the power of flight and denying it to others, but making it easier for these others to reproduce, was described by Dr. H. M. Parshley, associate professor of zoology at Smith College, in a paper presented yesterday before the Entomological Society of America.

"The familiar long-legged waterstriders or 'skaters," said Dr. Parshley, live on the surface of ponds and streams, where under ordinary conditions they have no use for wings. The development of these organs would thus incur an unnecessary drain on the vitality of the individual, and would be a positive detriment rather than an advantage to the species Moreover, in many of the species the structure of the wings, when present, is such as to prevent mating; so that the winged individuals are brought to the necessity of voluntarily breaking off the projecting portions to make reproduction possible.

Pterygopolymorphism

But if the pond dries up or becomes overcrowded the situation is changed and wings become necessary as a means of dispersal, since these insects are unfitted for walking on land. These conflicting needs have set a problem, which has been neatly solved in the course of evolution.

The answer in a word is pterygopolymorphism; that is, among the adult individuals of a given species some have wings and some do not. In this way the race is freed to a large extent from the drain of unnecessary wing production and from anatomical hindrances to mating, while the power of flight is retained in the heredity producing winged individuals often enough to insure the performance of occasional, necessary migrations.

WHITE CEDAR SUBJECT OF CONVENTION MEETING

During the past year the Appalachian Forest Experiment Station, in co-operation with the State Foresters of Virginia, North Carolina, and New Jersey, has carried on a rather thorough-going study of the southern white cedar, which, in spite of its value as timber, has remained a little known species for some time.

Yesterday, before the Ecological Society of America, C. F. Korstian, of the Appalachian Forest Experiment Station, gave a preliminary account of these investigations, touching simply upon the high lights inasmuch as a more detailed account will appear at a later date.

Southern white cedar is strictly a swamp tree, and although it is fastidious in respect to its habitat requirements, it has a great variety of associates, said Mr. Korstian. It is a prolific species, producing large crops of seed practically every year. The characteristic of bearing seed which will remain viable when stored in the forest floor for a year or more is of the utmost importance in the management of the white cedar swamps. Because of this, too, it is evident that in most cases the natural regeneration of the valuable southern white cedar is assured.

TRACKS OF ATOMS IN AIR PICTURED

Members of Physical Society Hear Talk on Electrons and Ions

HELIUM AND AIR DISCUSSED

Dr. R. W. Ryan and Dr. W. D. Harkins of the University of Chicago presented a paper before the American Physical Society of the A. A. A. S., yesterday, in which they announced that they had obtained ten thousand photographs showing the tracks produced by atoms shooting through air at a speed thirty thousand times faster than that of the swiftest rifle bullet.

"It is of interest," said the paper, "that the atoms of helium usually shoot directly through half a million atoms of the air without hitting the central part of the atom which alone is heavy enough to deflect the helium atom from its path. Thus it is clear that atoms instead of being incapable of penetration, as was taught twenty years ago, are highly penetrable to other atoms if they shoot fast enough.

Atoms Electrify Each Other

"The most interesting feature of the present photographs may be made clear by describing the most interesting of all the thirty or forty thousand atom tracks photographed . In this a helium atom moves about an inch straight through about an inch of air and directly through about 100 thousand atoms, then by accident it hits the center or nucleus of an atom of nitrogen. The helium atom rebounds almost directly backward at a velocity of about 20,000 times that of a rifle bullet, while the nitrogen atom is knocked directly forward at about two-thirds of this speed.

"Thus not only is the track of a single atom made visible, but also the effects of the collision with another atom is also plainly photographed. Several different types of atom collision have been found in the photographs. The chief interest in the problem is that by taking enough photographs it may be possible to phhtograph the disintegration of an atom produced by the high speed collision.

"When an atom passes through other atoms it electrifies them, or technically speaking, ionizes them. These ions and the electrons thus produced attract water molecules and thus water drops are formed, just as in a rain cloud, except that these water drops lie exactly in the track upon which the atom has passed. By eliminating the train of water drops by a brilliant light, a bright line of light is observed and may be photographed by the use of a high speed lens.

"The present work was done by the use of a Universal moving picture camera, and illustrates a new use for moving picture machines. The tracks may be easily shown in the moving picture theaters."

Calendar of Today's Events

American Association as a Whole
12:30-1:30—Luncheon at Harvard University, Memorial Hall.
3:00-5:00—Informal Tea, room 10-340, M. I. T.
4:00-6:00—Informal Tea, American Academy of Arts and Sciences.
8:00—Invitation Lecture by Dr. W. M. Davis, Walker Memorial.

American Mathematical Society
9:00—Council Meeting, Phillips Brooks House, Harvard.
10:00—Contributions, room 1, Harvard Hall.
2:00—Joint Session with Mathematical Association of America.

American Physical Society
10:00—Joint Meeting with American Astronomical Society, Lecture Room, Jefferson Physical Laboratory, Harvard.
2:00—Retiring Vice-President's Address and Symposium.

Section C, Chemistry
10:00—Symposium, Progress of Chemistry, Colloids, and Photo-chemical Reaction, room 2-390, M. I. T.
2:00—Joint Session with Section G and Physiological Section of the Botanical Society of America.

American Astronomical Society
See American Physical Society above.
2:00—Contributions, Astronomical Laboratory, Harvard.

Section E, Geology and Geography
10:00—Vice-Presidential Address, and Contributions, room 4-370, M. I. T.
2:00—Visit to Agassiz Museum.

American Society of Zoologists
9:00—Contributions, room 1-190, M. I. T.
2:00—Contributions, room 1-190, M. I. T.

American Society of Economic Entomologists
10:00—Annual Address of President, and Contributions, room 3-270, M. I. T.
1:30—Contributions, room 3-270, M. I. T.

Botanical Society of America
9:00—Business, room 1-150, M. I. T.
10:00—Meeting with Ecological Society of America, room 3-470.
2:00—Conribtutions, room 1-150, M. I. T.
7:00—Botanists' Dinner, Young's Hotel.

Ecological Society
9:00—Joint Meeting with Botanical Society, room 1-150.
2:00—Contributions, room 3-470.
4:30—Business, room 3-470.

American Miscroscopical Society
12:00—Council Luncheon.
4:30—Business, room 4-357.

American Nature-Study Society
10:00—Contributions, room 2-180.
2:00—Contribuions, room 2-180.
6:00—Dinner at Hotel Bellevue.

American Anthropological Association
10:00—Contributions, room 8-205.

American Folk-lore Society
9:00—Council Meeting, room 8-205.
2:00—Council Meeting, room 8-205.
2:30—Contributions, room 8-205.
7:00—Dinner, Louis' Restaurant.

Section I, Psychology
10:30—Symposium, room D, Emerson Hall, Harvard.
2:30—Joint Session with the American Psychological Association, room D, Emerson Hall, Harvard.

American Psychological Association
9:30—Joint Session with Secion I, Contributions, room D, Emerson Hall, Harvard.
2:30—Joint Session with Section I, Psychology, Emerson Hall, Harvard.
7:00—Annual Dinner, Harvard Union.

Section K, Social and Economic Sciences
9:30—Contributions, State House.
2:00—Symposium, Conservation, room 5-226.

Section L, Philological Sciences
2:00—Symposium, Humanizing Knowledge, room 10-250.

American Society for Horticultural Sciences
9:30—Contribtuions, room 10-275.
1:30—Contributions, room 10-275.
6:00—Dinner, City Club.

Society of American Foresters
9:30—Contributions, State House.
7:00—Banquet, Hotel Brunswick.

New England Forestry Congress
9:30—Contributions, State House.
2:00—Contributions, State House.
7:00—Banquet, Hotel Brunswick.

Potato Association of America
9:30—Reports and Contributions, room 1-135.
2:00—Conference, room 10-419.

Section O, Agriculture
2:00—Contributions, room 2-390.
6:00—Dinner, City Club, Boston.

Society for the Promotion of Agricultural Science
5:00—Business, room 2-290.

American Nature-Study Society
6:00—Dinner, Hotel Bellevue.

Section H, Anthropology
7:00—Dinner, Louis' Resaurant.

Maya Society
7:00—Dinner, Louis' Restaurant.

American Society of Agronomists
6:00—City Club, Dinner.

PUBLIC HEALTH AND WORLD NEEDS ARE DISCUSSED

Cornell President Outlines Great Gains Made for Nation's Good

URGES FULL SUPPORT FOR HEALTH MOVEMENTS

Lack of Success in Abating Degenerative Diseases Is Big Problem

At the second general meeting of the A. A. A. S., the annual Sigma Xi lecture, held in room 10-250 last night, Dr. Livingston Farrand, President of Cornell University, reviewed the progress made in public health in this country which since 1870, he asserts, has lengthened the average life by 15 years, and has greatly reduced the amount of infant mortality, tuberculosis, typhoid, smallpox, and almost every disease to which man is susceptible. Thus far the efforts of the public health officers and organizations have, however, been unable to prevent an increase in the degenerative diseases of later life.

In discussing the world problem of re-establishment of social, economic and political order, Dr. Farrand emphasized the importance of human vitality as a fundamental factor in the process. The undermining of vitality in Europe as a result of the war and particularly of the child population has served to draw attention as never before to the problem of public health. It is now possible to review the situation in the United States and the survey offers certain striking figures. The observations of the 1920 census show that the average length of life in this country is now 56 years, said Dr. Farrand. This shows an increase of 3¼ years in the expectation of life since 1910, and had it not been for the influenza epidemics of 1919 and 1920 the increase would doubtless have been greater. The best available figures indicate a lengthening of the average life in this country by 15 years since 1870 and is eloquent testimony to the value of the researches of Pasteur and his successors to which this result is largely due.

Dr. Farrand also cited figures from the leading countries of Europe, showing that America now compares favorably with the older nations. The highest figures available for any country are those of New Zealand, where the average life is about 60 years. This is contrasted with civilization like that of India, where no advance has been shown during recent decades and the average remains only about 24 years.

The speaker quoted with approval the resolution of the American Public Health Association at its recent annual meeting in which it stated the conviction that with no further additions to our knowledge of the causes and prevention of diseases it will be possible during the next half century to add at least 20 years to the span of life.

Dr. Farrand also cited the reduction in the general death rate in the original registration states (New England and adjoining states) from 17 in 1900 to 14 in 1920. He pointed out that applied to the country this means the saving of approximately 400,000 lives for the year 1920 alone.

The leading causes of death were then reviewed by Dr. Farrand. He showed where great progress in prevention has been made and the chief problems which remain to be solved.

In the encouraging group he mentioned infant mortality, tuberculosis, typhoid, the infectious diseases of

(Continued on Page 3)

REMEMBER! TODAY IS THURSDAY—HARVARD DAY