DR. K. T. WATANABE, of Osaka, and Dr. Masao Muto, of Sendai, Japan, were guests of the Wistar Institute on November 11. Dr. Muto is an associate of Dr. Shinkishi Hatai, formerly a member of the institute, now director of the Biological Institute of the Tohoku Imperial University in Sendai.

DR. P. A. VAN DER BIJL, professor of plant pathology and mycology at the University of Stellenbosch, South Africa, has been visiting laboratories of phytopathology and mycology in the United States.

A JOINT expedition, arranged by Washington University and the Missouri Botanical Garden to seek plant specimens in the jungles of Panama, has sailed from New Orleans. Members of the party are Dr. Carroll W. Dodge, mycologist at the garden and a member of the Washington University faculty; Dr. Julian Steyermark, formerly graduate student in botany at Washington University, and Paul Allen, student at the garden. The expedition is being partly financed from the Science Research Fund of Washington University, given by the Rockefeller Foundation.

DR. THOMAS H. JOHNSON, of the Bartol Research Foundation, has returned from a three months' trip to Colorado and Mexico which was undertaken for the purpose of measuring the east-west asymmetry of the cosmic radiation at various elevations and latitudes. Extensive observations were made at Mt. Evans and Echo Lake in Colorado and at Nevado de Toluca, Villa Obregon, Vera Cruz and Parral in Mexico. The survey was a continuation of that begun last year as a part of the program authorized by the Cosmic Ray Committee of the Carnegie Institution of Washington and it was financed by a grant from that institution. Dr. Johnson was assisted by Lewis Fussell, Jr.

DR. GLEB V. ANREP, professor of physiology at the Egyptian University, Cairo, will deliver the 1935 series of Lane Lectures at Stanford University School of Medicine in April. The five lectures will cover different phases of "Regulation of the Cardio-Vascular System."

DR. H. E. EWING, entomologist in the Bureau of Entomology and Plant Quarantine, has accepted an invitation to deliver ten lectures to the class in medical entomology at the Johns Hopkins University School of Hygiene and Public Health.

THE third Harvey Lecture of the New York Academy of Medicine will be given by Dr. Wilbur A. Sawyer, associate director of the International Health Division of the Rockefeller Foundation, on Thursday evening, December 20, at eight-thirty, on "The Present Geographical Distribution of Yellow Fever and its Significance." The fourth lecture will be given on January 17, by Professor Alfred N. Richards, professor of pharmacology, University of Pennsylvania, on "Processes of Urine Formation in the Amphibian Kidney."

THE first Friday evening discourse of the new session at the Royal Institution was delivered on November 2 by Dr. F. W. Aston, who took as his subject "Elements and Isotopes."

THE annual meeting and dinner of the New York Academy of Sciences will be held on Monday, December 17.

DISCUSSION

THE SEQUENCE OF INFECTION, ALLERGY AND RESISTANCE AS REPRESENTED BY X-RAYS IN HUMAN PULMONARY TUBERCULOSIS

BROADLY speaking, the course of tuberculosis represents an immunologic conflict between the host tissues on the one hand and invading tubercle bacilli on the other. This note is founded on a "case" in which the organic and symptomatic manifestations of the disease were correlated with certain theoretical tenets generalized from animal experimentation; it emphasizes the opinion that, interpreted through a code such as follows, an obscure pathologic history may sometimes be resolved into an intelligible story:

(1) Introduction of living tubercle bacilli into a healthy living body leads to functional changes through which the tissues become thereafter *hypersensitive* to contact with tubercle-protein ("antigen") —an admitted fact. (2) The hypersensitive tissue has undergone a physico-chemical change which has two functional aspects: (*a*) Specific resistance is opposed to the passage of tubercle bacilli over it; (*b*) the hypersensitive tissue becomes the seat of biologic reaction, directed either to the immediate destruction of tubercle bacilli, probably by lysis, or to their incarceration and fixation *in situ* in tubercles. The intensity of both these functional changes probably decreases with the distance from the infective foci. (3) In an acutely tuberculous subject even slight physical exercise causes inflammatory congestion about tubercles and *pari passu* vascular engorgement in their vicinity. The same reaction may be

caused experimentally and quantitatively by hypodermatic injection of tuberculin.

The evidence of vascular congestion as depicted on the roentgenogram is a valuable index of a resting patient's allergic susceptibility, or its absence after exercise, of acquired resistance.

(4) It probably frequently happens, as in our case, that the anti-bacterial lytic power in proximity of the primary focus of infection is so strong that the development of tubercles there is wholly prevented, and through continuance of rest allergy and fever subside and a feeling of normal well-being is restored. But, nevertheless, this is a critical period; for the hitherto unaffected contralateral lung may simultaneously, without morbid symptoms, become the seat of congestion and deposition of miliary tubercles. Such an occurrence finds plausible explanation if we suppose that specific hypersensitiveness of the contralateral lung causes fixation of intruding tubercle bacilli which the local tuberculolytic power is not sufficiently developed to dissolve, the forces of tissue resistance being constrained to the more leisurely process of tubercularization. With continuance of mental and physical rest complete annihilation of these foci of disease may occur through absorption, fibrosis or calcification. On the other hand, it seems probable that in neglect of such precautionary rest we have the explanation of the serious problem of the actively tuberculous contralateral lung.

The case here recorded was pictured throughout its course by a medical roentgenologist, Kenneth D. A. Allen, and will be described fully in an early issue of the *American Review of Tuberculosis*.

HENRY SEWALL

DENVER, COLORADO

THE ROLE OF DAMPING-OFF DISEASES IN RELATION TO FAILURES OF ALFALFA STANDS ON SOME ACID SOILS[1]

A DAMPING-OFF disease of alfalfa has been found to be associated with acidity in three Iowa soils. Alfalfa seedlings grown in the field during June, 1933, on acid Clarion loam and Tama and Webster silt loams were 41, 48 and 16 per cent. diseased, respectively, while on neutral Clarion and Webster silt loams only seven and six per cent., respectively, were diseased. In germination and emergence stages, infected alfalfa seedlings are rapidly invaded, so that complete collapse and general necrosis takes place in less than 24 hours. Older seedlings appear to be less susceptible to general invasion and necrosis, but until the plants are fully established the parasite seems able to produce local lesions on the hypocotyls and primary roots.

Isolations from recently collapsed tissues of infected seedlings appear by their mycelial characters and their habit of conidia or sporangia production to be species of the genus Pythium. Infection trials with these cultures on alfalfa seedlings grown in sterile soil indicate that they are pathogenic.

When acid soil was steamed for two hours at 15 pounds or treated with ½ per cent. formaldehyde it grew a higher percentage of healthy alfalfa seedlings than did untreated neutral soil. There has been some indication that limestone and hydrated lime will inhibit damping-off in acid soil. Less damping-off of alfalfa seedlings occurred in pots of acid soil at a temperature of 9° C. than in similar pots kept at 20–25° C.

It seems highly probable that we have overlooked the rôle of damping-off fungi incident to failure of alfalfa stands on some acid soils.

WALTER F. BUCHHOLTZ

IOWA AGRICULTURAL EXPERIMENT STATION

WANTED: HALOS IN MICA

THERE are four main types of methods of determining geologic ages: (a) By the ratio of the radioactive lead produced by the decay of uranium, thorium or actinium to the amount remaining. This has been mainly successful with minerals containing these elements in quantity. When the mineral is obtainable in quantity so that one can obtain the lead isotopes or atomic weight,[1] it is reliable, especially if the age is confirmed on various minerals containing lead from different elements.

(b) By the helium produced. This has been most successful in fine-grained traps and meteorites in the hands of Paneth and Urry[2] where very minute quantities are present.

(c) By the loss of radium owing to its decay, as applied by H. Schlundt to recent tufas.[3]

(d) By the halo rings of discoloration around minute particles of radioactive matter enclosed in mica. This was first suggested by Joly, but Professor G. H. Henderson, of Dalhousie University, Halifax, Nova Scotia, has opened a vista of promise by devising a method of comparing the relative strength of the rings produced by elements that have different rates of decay.[4]

I am delighted to hear that the Carnegie Corporation of New York has granted aid in his researches. Geologists and mineralogists should help by provid-

[1] Journal Paper No. J 190 of the Iowa Agricultural Experiment Station, Ames, Iowa. Project No. 77.

[1] Confer von Grosse or J. P. Marble, *Jour. Am. Chem. Soc.*, 56: 854, 1934.

[2] *Chem. Review*, 13: 305–346, 1933.

[3] Report of the Committee on the Measurement of Geologic Time, 1934, page 34.

[4] *Proceedings* of the Royal Society A. 145: 563–598, 1934.