THE RAMAN SPECTRUM OF HEAVY WATER

THE Raman spectrum of 80 per cent. heavy water obtained with a sample supplied by Professor Taylor, of Princeton, when compared with the spectrum of the 18 per cent. material previously reported, shows that the water molecule with two atoms of heavy hydrogen gives a Raman band with a frequency difference of 2517, while the molecule with one atom of heavy and one of light hydrogen gives *two* bands, one of frequency difference of 2623, the other of 3500. Ordinary water gives a band with frequency difference 3445. A single photograph of a sample of given concentration does not bring out this shift as the bands overlap, but by superposing the two photographs taken with different concentrations the shift in the center of gravity of the bands comes out in a very striking manner.

Preparations have now been made for photographing the spectrum of the vapor in which case we shall doubtless find double lines in place of the superposed and slightly shifted bands.

R. W. WOOD

THE JOHNS HOPKINS UNIVERSITY
JANUARY 2

REPORTS

WORK OF THE NEW YORK BOTANICAL GARDEN

SIGNIFICANT new activities of the New York Botanical Garden are noted in the annual report of the director to the Board of Managers which met on January 8. These include an exhibit during 1933 of plants for home aquaria, which will continue for two or three months more in the Museum Building, and the issuing for the first time of a seed list, making possible exchange of desirable species of plants with other institutions.

Through its new seed list, the garden is offering to botanical institutions throughout the world 500 species and varieties of plants, some native, some exotic and a number of them never before available from such a source.

In the greenhouses the most striking development of the year, according to Dr. Merrill, has been the naturalistic planting of the succulents in Conservatory Range 1, giving those interesting plants which are built to store water during long periods of drought an indoor rock-garden effect for a background.

Other changes still in progress, affecting the collections of ferns, cycads, aroids, bromeliads, bananas, begonias and orchids, are tending also to make the plants appear as though growing in their native haunts, rather than formally displayed in pots or tubs. The special display house for flowering plants in their season, inaugurated a year ago, has been continued this winter, and has attracted many hundreds of additional visitors to the conservatory.

Dr. Merrill emphasized the importance of the science course given for professional gardeners—including some of the gardening employees of the institution—calling it "the most significant innovation in the field of public instruction during the history of the garden." First- and second-year classes are now being attended by about 125 men and five women whose actual employment as gardeners over a period of years has entitled them to enrolment in the course. Such fundamental subjects as plant physiology and classification, chemistry, plant diseases and soils and fertilizers are being given. This course, started in the fall of 1932, is the first one of its kind to be given in America.

About two thirds of the Thompson Memorial Rock Garden, being constructed over more than two acres of ground in the glade east of the Museum Building, is now completed, Dr. Merrill reported, and a portion of this, having been planted last fall, will be blooming for the first time in the spring. Several thousand additional plants are now being raised in the propagating house, to be set out in the new rock garden in a few months.

Three thousand seedlings of rhododendrons and azaleas are also being grown at the garden, to be used eventually for bordering the walks and drives throughout the grounds.

The outdoor plantings of daffodils, iris, roses, peonies, cannas, dahlias and chrysanthemums, of which there are special displays each year, have all been increased in 1933. And the perennial border presented to the garden by the women of the Advisory Council has been most satisfactorily maintained.

The plantings of daylilies (Hemerocallis) and of Louisiana iris have been extended. In addition, a display planting of species and varieties of Hemerocallis has been created. Next summer it is hoped to have the first flowers from seedlings of hybrids of Louisiana iris.

Gifts of plants made to the Botanical Garden during the past year include rare shrubs and rock garden plants from the Boyce Thompson Arboretum; 140 orchid plants from George Baldwin and Company; cuttings of Erica, Calluna, Sedum and other genera from Clarence Lewis; 47,600 tulip and hyacinth bulbs for next spring's display from the Dutch Exporters' Association; cuttings of 140 species and varieties of conifers from the Arnold Arboretum and from Colonel Robert Montgomery; palms and cycads, also from

the Montgomery estate; 500 rose bushes from Bobbink and Atkins; 700 packets of seed selected and purchased by Stanley Ranger, and cannas, iris, dahlias, chrysanthemums, peonies and other plants for display purposes from a number of growers.

Gifts of money included $3,140 for the permanent endowment, $410 for current expenses and $1,942 for restricted purposes.

The library, which is the largest combined horticultural and botanical library in America, now numbers 43,429 bound volumes, of which more than 1,000 were added in 1933.

SCIENTIFIC APPARATUS AND LABORATORY METHODS

AIDS IN THE STUDY OF DENTAL CARIES WITH ALBINO RATS

RECENT reports[1] on the study of dental caries in the rat indicate that in such studies macroscopic examinations of the teeth were made only at autopsy. It is obvious that periodical examinations of the teeth made while the animal is still alive would be very advantageous, as then the course of the lesion could be followed.

Such observations have been carried out in this laboratory for the past two years, using the following procedure: The assistant holds the rat as indicated in the diagram (Fig. 1). With the rat grasped and

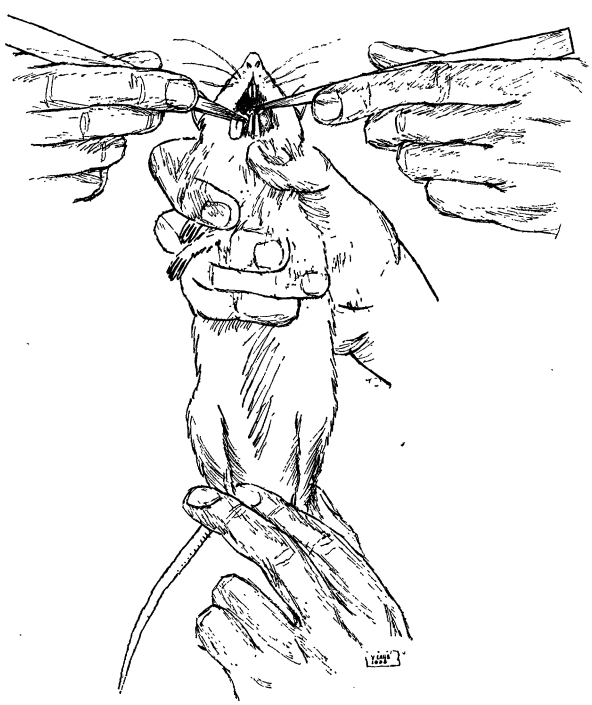

FIG. 1.

held in this position there is no danger to the assistant or the observer. The observer, wearing a Murphy head light and a Beebe binocular loupe, holds a pair of 3½ inch blunt forceps in each hand. Assuming that the left side of the rat's mouth is to be examined, the observer opens the animal's mouth by using the forceps in the right hand. The forceps in the left hand is now used to pull out the rat's tongue gently. The forceps in the right hand is now used to push the left cheek of the animal aside, thus permitting examination of the teeth on the upper and lower jaws. For observations on the opposite side this process is, of course, reversed.

The question of inorganic elements in blood serum in relationship to dental caries has also assumed importance recently.[2] It is, of course, desirable in such studies to obtain the maximum amount of serum in order to permit accurate determinations.

We have used the following modification of the method described by Kramer and coworkers:[3] With the animal lightly anesthetized by ether, the skin is removed from the neck region by cutting with scissors.

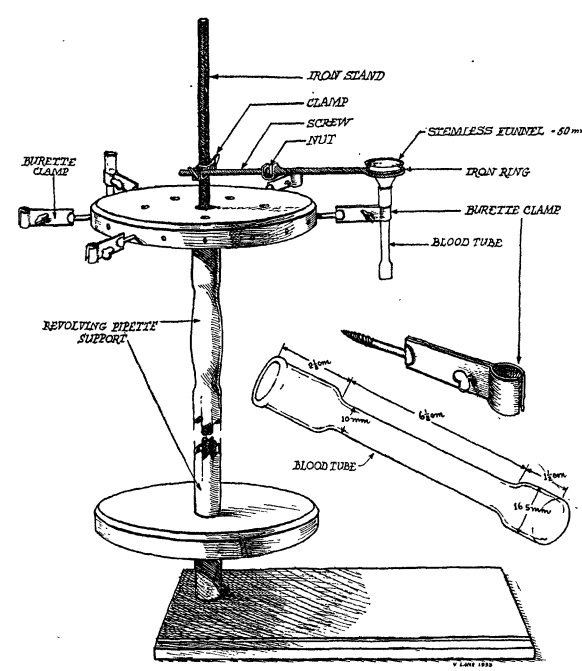

FIG. 2.

[1] H. Klein and E. V. McCollum, *Jour. Dent. Res.*, 13: 69, 1933; M. C. Agnew, R. G. Agnew and F. F. Tisdall, *Jour. Amer. Dent. Assoc.*, 20: 193, 1933; D. E. Shelling and D. E. Asher, *Jour. Dent. Res.*, 13: 363, 1933.

[2] H. Klein and E. V. McCollum, SCIENCE, 74: 662, 1931; M. C. Agnew, R. G. Agnew and F. F. Tisdall, *Jour. Amer. Dent. Assoc.*, 20: 193, 1933; D. E. Shelling and D. E. Asher, *Jour. Dent. Res.*, 13: 363, 1933; I. Neuwirth and P. Brandwein, *Jour. Dent. Res.*, in press.

[3] B. Kramer, M. J. Shear and J. Siegel, *Jour. Biol. Chem.*, 91: 271, 1931.