IN the school of medicine at Stanford University, Dr. George D. Barnett, Dr. W. Edward Chamberlain and Dr. Henry G. Mehrtens have been promoted to full professorships in the department of medicine. In the same university Dr. Maurice L. Tainter has been promoted to an assistant professorship of pharmacology.

DR. HULSEY CASON has been appointed assistant professor of psychology at the University of Rochester.

J. W. BARKER has resigned his position as professor of chemistry in the Junior College of Flat River, Mo., to fill an assistant professorship in the chemistry department of Wittenberg College.

PROFESSOR W. W. C. TOPLEY has resigned from the chair of bacteriology and the directorship of the public health laboratory at the University of Manchester, as from September next, when he will take up his duties as professor of bacteriology and immunology in the new London School of Hygiene and Tropical Medicine.

THE chair of mineralogy and geology at the University of Lille has been changed to a chair of geology and physical geography and M. Leriche has been appointed to the position.

DISCUSSION AND CORRESPONDENCE

THE LUNAR ECLIPSES OF 1927

THERE are to be two lunar eclipses in 1927, about the middle and end of the year. Some of their relations to the earth's atmosphere are as follows:

1927 June 15, the first eclipse is at its height (mid-eclipse) at 8 h 24.2 m, Universal Time; but the moon barely gets within the umbra on the north side of the earth's shadow. The radius of the geometrical umbra is 40.8′; the outer limb of the moon at mid-eclipse is distant 40.7′ from mid-shadow. At this moment the edge of the shadow nearest to the moon's limb is cast by the earth's surface and atmosphere at about W 97.3°, N 63.75°, in the neighborhood of Baker Lake, which drains into Chesterfield Inlet, on the west shore of Hudson Bay. It would be very interesting to know the weather, cloud and sky conditions in this region at this moment. But the atlas indicates hardly any population there.

In the eclipse of 1892 November 4 the outer limb of the moon was 43.0′ from mid-shadow, the radius of the geometrical umbra was 45.4′, so that the immersion was deeper than in the coming case. But Gale, at Sydney, N. S. W., reported the limb so bright as to give the impression that the eclipse was not total; Russell, also at Sydney, said definitely that it was not total; Doberck, at Hong Kong, remarked on the brilliancy of the immersed limb. We may expect this time to observe the density of the earth's shadow very near to the edge, but due to weather and climate conditions very different from those which ruled in 1892. Then the grazing point was over water, between Iceland and Norway, north of the Shetland Islands.

The last rays on the moon's limb at first contact with the umbra graze the earth's surface or atmosphere about W 174.7°, N 32.7°. This is at sunset on the open Pacific, north of Pearl and Hermes. The rays at last contact in like manner graze about W 69.1°, N 17.6°, a point at sunrise in the Caribbean Sea, considerably south of Catalina Island, south of Santo Domingo. Observations of weather, cloud and sky at these points are desired, for comparison with direct observations of the shadow edge at these moments.

The two internal contacts at this eclipse come so close together that they are hardly separable from mid-eclipse. At mid-eclipse the sunrise-sunset line, centered about the subsolar point at E 54.0°, N 23.3°, passes by Cape San Roque, Nova Scotia, Great Bear Lake, New Guinea, Gulf of Carpentaria and Enderby Land. Of all this great circle, however, only a fraction, perhaps 35°, on the two sides of the Baker Lake region, is effective in illuminating the eclipsed moon.

The second lunar eclipse, on December 8, with middle at 17 h 34.6 m, Universal Time, is of much deeper immersion, 11′ or more at most, in the southern half of the shadow. The inner (north) limb of the moon just covers the middle of the shadow. The grazing light at the contacts comes from regions about the points indicated:

First Contact: E 41.6°, S 25.7°, in the Mozambique Channel, between Tullear and Europa Island, at sunset.

Second Contact: E 51.0°, S 51.3°, in the Sea Tang, south of the Crozets, at sunset.

Third Contact: E 164.4°, S 22.0°, southwest of New Caledonia, at sunrise.

Fourth Contact: E 157.0°, S 3.5°, northeast of Bougainville Island, at sunrise.

Observations of weather, cloud and sky at these points are desired, for comparison with observations of the shadow edge at the contacts.

At mid-eclipse the sunrise-sunset line is centered about the subsolar point at W 85.75°, S 22.7°, and passes over or near Kaiser Wilhelm Land, Fiji Islands, Sitka, Timbuctoo, Mossamedes, Cape Town. The whole southern half of this great circle is effective in illuminating the eclipsed moon at this moment.

The mere naming of the grazing points above indicates that observations within a few degrees of them are unlikely to be obtained. Still, it is desired that persons near any such, at sea or ashore, report their observations of weather, cloud and sky, at the sunrise or sunset moments indicated, either to some scientific journal or to the address, Lunar Eclipses, Harvard College Observatory, Cambridge, Mass., U. S. A.

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RESEARCH ON VIRUSES CAUSING PLANT DISEASES

BECAUSE of failure to determine the nature of filterable viruses by microscopic or culture methods, plant pathologists have for some time been attempting to obtain less direct evidence on the nature of these disease-causing agents by studying their resistance to various treatments, such as desiccation and exposure to chemicals. The results of such studies are very valuable but are often difficult to interpret, because the virus, as heretofore studied, has been contained in a complex medium, the host plant extract.

It is well known that the properties of colloids may be greatly modified by the addition of certain substances. For example, Mines[1] has shown that the addition of certain protective proteins to colloidal gold may cause the latter to exhibit properties characteristic of proteins. Similarly, it appears possible that protective colloids, as well as other factors in the complex plant extract, may so modify the properties of a virus as to give an erroneous impression of its real nature.

The marked resistance of some of the viruses to toxic chemicals suggests the possibility that such viruses may remain infective after various purification treatments and may therefore be obtained in a fair degree of purity. The properties of such purified or partly purified virus should be more reliable as an indication of its nature than properties exhibited by a virus contained in complex plant extract.

A study of the literature on viruses and enzymes has suggested the possibility that the operations recently used by Sherman, Caldwell and Adams[2] and others in attempting to isolate enzymes may be successfully used in similar attempts to purify viruses. Among the operations which may be useful in such work are selective adsorption, treatment with microorganisms, precipitation, cataphoresis, centrifugation, sedimentation and dialysis.

While numerous studies on virus properties such as longevity, resistance to drying and chemicals, and inactivation by certain plant juices have been made, it appears that the available evidence, although very valuable, is insufficient to warrant conclusions as to the animate or inanimate nature of the viruses. Other similar experiments which appear promising for furnishing further evidence on this question are listed below.

(1) Since the protozoa appear to be particularly susceptible to high oxygen concentrations, Cleveland[3] has suggested that evidence on the nature of the viruses might be obtained by subjecting them to oxygen treatments. The influence of the absence of oxygen should also be very interesting.

(2) Test viruses for tropisms.

(3) Cataphoresis of a virus at various hydrogen-ion concentrations and before and after treatment with other ions.

(4) Attempt to inactivate a virus by mixing it with colloids of known composition. If inactivation is successful attempt to reactivate the virus by methods similar to that used by Johnson-Blohm[4] in reactivating rennet. These methods may also be useful in reactivating a virus which has been inactivated by certain plant juices.

(5) Attempt to separate the causal agent into several components by dialysis or other separation methods.

(6) Test host tissues for compounds often produced by microorganisms.

(7) Attempt to detect respiration in the viruses.

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NATIVE AMERICAN APPLES

THE indigenous apples of America form an interesting group of species that have been neglected because the cultivated apple, Pyrus Malus, with better and larger fruit, came from Europe more than three centuries ago. However, a few trees with large fruits have been found among wild American apples. During many years the writer has made a study of these large-fruited sports found in the woods of our western states, especially Iowa, Illinois, Missouri, Wisconsin and Minnesota. Many hybrids have been originated at the South Dakota Experiment Station, and it is now time to publish some of this material. I would like information concerning any large-fruited trees of the wild American apple, with specimens of the fruit and notes as to the history and location of the trees. Please help in this search so that a list may be published for future use.

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[1] *Koll. Chem. Beihefte*, 3: 191–236, 1912.
[2] *Jour. Amer. Chem. Soc.*, 48: 2947–2956, 1926.
[3] SCIENCE, n. s., LXIII: 168–170, 1926.
[4] *Zs. Physiol. Chem.*, 82: 178–208, 1912.