Josiah Willard Gibbs lecture by Dr. P. W. Bridgman. On Wednesday morning there will be a joint session with Section B of the American Association for the Advancement of Science with the address of the retiring vice-president of Section B, Professor F. K. Richtmyer, and an address by Dr. H. H. Kimball. On Wednesday afternoon there will be a joint session with Section E of the association and the Society of Petroleum Geophysicists for a geophysical program.

ACCORDING to an announcement in *Nature* the Ninth International Congress of the History of Medicine will be held at Bucharest, under the presidency of Dr. V. Gomoiu, next September, when the principal subjects for discussion will be (1) the evolution of medicine in the Balkan States and (2) the protection of Europe against bubonic plague. Those wishing to contribute papers on these or other subjects are requested to forward the title and a typed copy of a summary of their paper to the office of the Congress, Str. Stirbey Voda 86, Bucharest II, without delay. The official languages will be English, French, German, Italian and Spanish. Members of the congress can take the direct route to Bucharest or meet at Trieste, whence visits will be paid to Athens, Constantinople and Constantza, where local committees will be arranged for their reception. The meetings of the congress will occupy four days, and the following three days will be devoted to a tour of Bucharest and excursions in the neighborhood. A program will be issued later, giving the exact date of the congress and the amount of the subscriptions.

Nature reports that the twenty-second annual exhibition of electrical, optical and other physical apparatus is to be held by the Physical Society and the Optical Society from January 5 to 7, 1932, at the Imperial College of Science and Technology, South Kensington. The trade section will comprise the exhibits of manufacturing firms. The research and experimental section will be arranged in two groups: (*a*) exhibits illustrating the results of recent physical research; (*b*) lecture experiments in physics. The exhibition committee invites offers, from research laboratories and institutions and from individual research workers, of exhibits suitable for inclusion in either of the above groups. Offers of exhibits, giving particulars of space and other facilities required, should be communicated immediately, and in any case not later than November 9, to the secretary of the exhibition committee, 1 Lowther Gardens, Exhibition Road, London, S.W.7. The section for apprentices and learners has for its object the encouragement of craftsmanship and draughtsmanship in the scientific instrument trades. Apprentices and learners may exhibit, in competition, specimens of their work, providing they are in the regular employ of a firm which is exhibiting at the next annual exhibition, or has exhibited once during the past three years. Printed particulars of this section will be sent on application to the secretary.

DISCUSSION

CONCERNING AN INCREASE IN THE POTENCY OF MOSAIC VIRUS IN VITRO

IN an earlier paper one of us (O.)[1] published results of experiments which indicated that multiplication of the virus of tomato and tobacco disease had taken place in the absence of living cells. The work of J. Henderson Smith[2] and others cited by him has not been confirmatory of these results, and hence the subject has been studied anew.

About 3,000 tomato plants (with several thousand as controls) were utilized in a series of 30 experiments. In 6 of them the original technique was followed as closely as possible. In 24 the conditions were altered considerably. The hydrogen-ion concentration of the media was kept constant by diluting one part of filtered fresh normal plant juice with 2.5 parts of Northrop's buffer[3] at pH = 5.3, and the tests were made under aerobic or anaerobic conditions, in the dark or sunlight. Fifteen experiments were carried out with Gates' U tubes,[4] according to the method of Muckenfuss and Rivers[5] with vaccine virus. A collodion sac containing fresh, lightly crushed, young plants in buffer solution was inserted in one arm of the tube and buffer solution containing filtered virus was placed outside the sac. The medium within the sac was replaced from one to seven times weekly. The tubes were kept at 28° C.

Almost always, irrespective of the method employed, there was some increase in the potency of the virus beyond the original titration. An increase has also been noted by McKinney.[6] In the early experiments it was much greater than in the later ones, for reasons as yet not clear. There may conceivably be some cyclic variation in the virus. The question arises of whether the increase was due to an activation, or a

[1] P. K. Olitsky, *J. Exp. Med.*, 41: 129, 1925.
[2] J. H. Smith, *Ann. Applied Biol.*, 15: 155, 1928.
[3] J. H. Northrop and P. H. de Kruif, *J. Gen. Physiol.*, 4: 639, 1922.
[4] F. L. Gates, *J. Exp. Med.*, 35: 635, 1922.
[5] R. S. Muckenfuss and T. M. Rivers, *J. Exp. Med.*, 51: 149, 1930.
[6] H. H. McKinney, *J. Agric. Res.*, 35: 1, 1927.

dispersion of aggregated virus particles, by a mechanism as yet not understood, or whether it represented actual multiplication of a living agent. The same problem has arisen in connection with the increase in potency of vaccine virus in a lifeless medium.

In view of the outcome of the experiments, we have concluded that the results of our tests can not with certainty be referred to a true multiplication of the mosaic virus.

PETER K. OLITSKY
FILIP C. FORSBECK

THE ROCKEFELLER INSTITUTE
FOR MEDICAL RESEARCH,
NEW YORK, N. Y.

GEOMORPHOLOGICAL EVIDENCE OF A CLIMATIC BOUNDARY

ONE of the most significant climatic boundaries across the United States separates the territory experiencing effective winter cold from warmer regions on the south. Within humid climates the northern region is often called the cool temperate and the southern, warm temperate climate. In the terminology of the Köppen[1] system of climatology the two are designated microthermal and mesothermal, respectively. Within the realm of the dry climates the distinction becomes that between hot and cold steppes and deserts.

In a recent paper the writer[2] has presented arguments in favor of using one and the same boundary whether climates are humid or arid and has suggested that in the United States the January isotherm of 32° F. appears more satisfactory than any other proposal thus far made.[3] Certain contrasts were pointed out in vegetational, soil, geomorphological and cultural forms on the two sides of that isotherm. Since the publication of that paper he has observed a very interesting and fundamental condition that lends additional support in favor of the January 32° F. thesis.

The January isotherm of 32° F. enters the Atlantic Seaboard approximately at New York City, swings southward through New Jersey and across the Appalachian region, west of which it approximates the positions of the Ohio and Missouri rivers as far as the eastern boundary of the dry climates

[1] W. Köppen, "Die Klimate der Erde" (Berlin, W. de Gruyter Co., 1923).

[2] R. J. Russell, "Dry Climates of the United States: I, Climatic Map," *Univ. Calif. Publ. Geog.*, 5: 1–41, 1931.

[3] W. Köppen (1923) uses the mean annual isotherm of 18° C. (64.4° F.) in dry climates and the January isotherm of −3° C. (26.6° F.) in humid climates. On the more recent Köppen-Geiger "Klimakarte der Erde" (1: 20,000,000), (Gotha, Justus Perthes, 1928), he uses the value of eight or more months above 1° C. (33.8° F.) in humid climates. Van Royen, *Monthly Weather Review*, 55: 319 (1927) suggests, for the dry climates, the cold month isotherm of 50° F.

In the Trenton Folio of the United States Geological Survey Florence Bascom[4] calls attention to the fact that in the Coastal Plain of New Jersey topography sloping toward the north is notably steeper than that toward the south. The writer is not only able to confirm this observation but finds that it applies with equal force in landscapes of southern Ohio. South of both of these regions it disappears, thus appearing to be related to the position of the January 32° F. isotherm both east and west of the Appalachians.

In both cases the nature of the underlying bedrock is such that it could not possibly account for the observed slope asymmetry, as it is very nearly flat-lying. It is obvious that the details of sculpture must be ascribed to denudational processes now taking place.

While contrasted angles of incidence of sunlight on north and south slopes condition processes of weathering, evaporation rates, vegetational cover, and other denudational elements, it seems apparent that the greatest single effect is with reference to snow cover. On the borderlands of the region effectively blanketed by snow for considerable periods during the winter months, slight differences in slope direction produce enormous contrasts in the length of time snow actually remains on the ground. The relatively sunny southward slopes are barren for long periods during which northward slopes lie beneath thin sheets of snow. The snow protects the ground beneath from denudation during much of the critical winter period. Thus a contrast arises in the rate at which denudation takes place on the banks of any rills or streams flowing in directions approaching east or west. The northern bank, being the more rapidly attacked, has its gradient lessened in comparison to the southern bank, hence arises the topographic contrasts observed.

It is notable that in the southeastern United States erosion and denudation take place very rapidly, particularly as the result of the absence of frozen soil or snow cover during the winter season of vegetational dormancy, whereas in the northeastern and north central regions these processes are comparatively slow. Agricultural occupation aggravates conditions to such an extent that the loss of soil from the fields of the southern states has become recognized as a major national problem, and one recently receiving much attention as a result of the studies of H. H. Bennett and others. From the standpoint of climatology the contrasted regions may be considered mesothermal and microthermal climates.

Recognizing that all climatic boundaries are attempts to indicate mean positions within zones of gradual change, the asymmetrical slopes of New Jer-

[4] Folio 167: 2, (1909).