uncommon in non-purulent infections of the respiratory tract. Bacteria leaving the body from the intestinal tract, on the contrary, are exposed to nutritive conditions conducive to the non-filterable rather than the filterable state. Hence it is perhaps not necessary to reiterate that many, if not most, of the "filterable viruses" have been found thus far in association with the respiratory, rather than the intestinal tract. This is not to be construed as an assumption that all "filterable viruses" exist in a non-filterable as well as a filterable state: only precise experiments with each disease entity will determine just what the limits to be applied ultimately to the term "filterable virus" shall be: nor is it by any means the whole story. *B. coli,* like *B. typhosus,* seems to become filterable without much difficulty by cultivation in the proper manner in protein media, but the fact that this microbe may thus become filterable does not explain why it is not ordinarily an invader of the body. The nature of the weapons with which certain kinds of bacteria, and not others, may force entrance through the epithelia which ordinarily suffice to keep microbes out, is yet to be determined. Just what part the filterable state of bacteria may play in the vastly complex phenomena of infection and immunity remains to be revealed. And there are exceptions to this hypothesis of association between protein nutrition and the filterable state. Leprosy appears to be such a case. Leprosy bacilli are readily stained within the tissues of lepers; that is, they exist there in a presumably non-filterable state. There is little evidence that there is much, if indeed any, tissue digestion round about them. Nevertheless, exceptions to the contrary, there is after all apparently a very distinct general biological parallelism between the occurrence of non-filterable, stainable bacteria, growing in ordinary media under the nutritional stimulus of peptone (peptophilic state) and filterable, not stainable organisms growing in protein-rich, peptone-poor media under the nutritional stimulus of protein (proteophilic state). And the well-established difficulties surrounding the isolation of microbes from some of the so-called "filterable viruses" (which appear to be developing in the protein tissues of the body and are refractory to cultivation in peptone media, even enriched with tissue) have their nearly precise counterpart in this connection with the corresponding experimental difficulties encountered in cultivating the fully protein acclimatized, filterable form of *B. typhosus* in peptone media, even those enriched with blood. It would appear indeed that one rather striking feature of the experiments with filterable forms of the typhoid bacillus is this very establishment of the proteophylic state, refractory to cultivation in ordinary, or enriched peptone media. If this indeed be the case, then it might be rather confidently predicted that at least some of the infections refractory to artificial cultivation should be approachable from the use of suitable protein media. A word about K medium should be injected at this point: it is very crude. This has been emphasized again[3] and again.[4] There is no more reason, *a priori,* for expecting successful isolation of organisms from influenza, common cold and smallpox, to mention three possible sources of culture, in K medium in its present crude state, than there is in expecting successful isolation of *Tr. pallidum,* meningococcus and tubercle bacillus, using merely plain, nutrient broth. Special modifications, to meet the needs of specific organisms, both for isolation and for cultivation of specific organisms in a filterable state, must be applied to the medium, as is required of the usual laboratory media for similar reasons. This is well exemplified by the recent work of Mellon,[12] who has just reported the successful filtration of the tubercle bacillus, and its recovery in the non-filterable state, using a modified K medium.

### CONCLUSIONS

(1) The intimate details of three successive filtrations of an authentic strain of *B. typhosus,* performed in four days, are recorded.

(2) The details of recovery of *B. typhosus* in the non-filterable state, and its identification by colony formation, by fermentation reactions, and by agglutination tests, are stressed.

(3) Attention is drawn to the perpetuation of *B. typhosus* in the filterable state by cultivation in a protein [K] medium.

(4) Emphasis is laid upon the biological significance of proteins in inducing the filterable state in bacteria.

(5) Certain theoretical relationships are suggested between this artificially induced filterable state of bacteria and certain microbic infections of man.

# OBITUARY

## MEMORIALS

THE section on medical history of the College of Physicians of Philadelphia, as reported in the *Journal* of the American Medical Association, held its stated meeting on March 14, in cooperation with the Henry Phipps Institute, the Philadelphia Health Council and Tuberculosis Committee and the Philadelphia Association of Tuberculosis Clinics to commemorate the

[12] Mellon, *Proc. Soc. Exper. Biol. and Med.,* Vol. 29, No. 2, p. 206, 1931.

fiftieth anniversary of the discovery by Robert Koch, March 24, 1882, of the tubercle bacillus. Addresses were made by Drs. Henry R. M. Landis, on "Reception of Koch's Announcement in the United States"; Theobald Smith, Princeton, N. J., "Koch's Views on the Stability of Species among Bacteria"; Lawrason Brown, Saranac Lake, New York, "What Koch Meant to Tuberculosis," and Damaso de Rivas, "Personal Reminiscences of Robert Koch."

CONTRIBUTIONS are invited to a memorial to Sir Andrew Balfour, first director of the London School of Hygiene and Tropical Medicine, who died a year ago. The medical men supporting the appeal include: Sir James Crichton-Browne; Sir Matthew Fell, late Director-General A.M.S.; Professor W. W. Jameson, dean of the London School of Hygiene and Tropical Medicine; Colonel P. S. Lelean, professor of public health, Edinburgh University; Dr. A. T. Stanton, chief medical adviser to the Secretary of State for the Colonies; and Dr. C. M. Wenyon, director-in-chief, Wellcome Bureau of Scientific Research.

A DINNER of the Royal College of Surgeons, at which the Lord Mayor of London was a guest, was held on February 11 to commemorate the two hundred and fourth anniversary of the birth of John Hunter. Dr. David Ross, the president, was in the chair. The toast "The Memory of John Hunter" was honored in silence. The president said that the presidential chair in which he sat would eventually be presented to the Royal College of Surgeons. He recounted the activities of the society during the past year and concluded by presenting Dr. Griffith Ifor Evans, of Carnarvon, with the Hunterian Medal, the first struck in gold, for an essay on "Chronic Familial Syphilis." The medal, he said, has been designed by Mr. W. Thornton Shiells, and a plaque was presented by the honorable treasurer, Dr. Irwin Moore.

## RECENT DEATHS

HARVEY M. HALL, staff member of the division of plant biology of the Carnegie Institution of Washington, a student of botany and ecology, died on March 11 at the age of fifty-eight years.

A CORRESPODENT writes: "Dr. Charles Ford Langworthy died in Washington on March 3 at the age of sixty-seven years. Dr. Langworthy was a chemist and was for many years one of the foremost workers in America on nutrition problems. During most of his active life he was connected with the U. S Department of Agriculture, first as associate editor of the *Experiment Station Record* and later as chief of nutrition investigations and chief of the Office of Home Economics."

MARY FRANCES SEYMOUR, professor of biology in Catawba College, Salisbury, N. C., since 1925, died on March 2. Professor Seymour was associate professor of biology at the North Carolina College for Women, Greensboro, N. C., 1916–1923.

A CORRESPONDENT writes: "Professor A. A. Jaczewski, eminent Russian mycologist and plant pathologist, died in Leningrad on February 12. Dr. Jaczewski organized and was director of the Jaczewski Institute of Mycology and Plant Pathology, which was, in this field, the central institute of all Russia. Dr. Jaczewski visited the United States in the summer of 1921. He was well and widely known for his texts and other scientific contributions. In the fields of systematic mycology and plant pathology he has long been recognized as the outstanding research leader and teacher of Russia."

# SCIENTIFIC EVENTS

## PSITTACOSIS IN CALIFORNIA

ON the basis of recent deaths from psittacosis in California, and positive findings in parrakeets from various parts of the state made by Dr. K. F. Meyer, of the Hooper Foundation for Medical Research of the University of California, the State Department of Public Health has adopted new rulings concerning the handling of parrakeets.

One of the new regulations makes psittacosis a reportable disease, and another restricts the importation and exportation of love birds and birds of the parrot family. The latter regulation reads in part as follows:

Whereas, It has been determined that birds belonging to the parrot family and infected with disease, and love birds so infected have infected other birds of the same family and that some of said birds have been infected with disease which may be transmitted to man; and

Whereas, It has become necessary to take action to prevent further infection of such birds in California and thereby prevent the extension of the disease to human beings; therefore, be it

Resolved, by virtue of the authority vested in this board by section 2979 of the Political Code of California, that the importation into and the exportation from the State of California of all birds of the parrot family and love birds, be prohibited for a period of not to exceed six months; provided that shipments of such birds from a foreign country consigned to another state or consigned from another state to a foreign country or consignments of such birds between other states, may be