which we knew to be very badly infested with larvae, we closed the box with gummed paper except for one corner where a small hole about 2 mm wide was left. When this box was opened up a month later, hundreds of dead larvae were found in the immediate vicinity of this hole in the box and still more hundreds were in the plants in the sheets from which they had been unable to escape.

The substance paradichlorobenzene kills not only the larvae and pupae, but also the eggs. It, of course, takes longer exposure to kill the eggs, but entomologists feel that the presence of a highly saturated atmosphere for two weeks will do this. It is our experience that this is undoubtedly the case.

In summary, paradichlorobenzene has been found to be an inexpensive, very proficient means of carrying on herbarium fumigation *in situ*, as it kills all forms of the pests with a minimum of caretaker's discomfort and is not a fire hazard.

FRANK C. GATES

MANHATTAN, KANSAS

AN IMPROVED METHOD FOR SEED GERMINATION

IN germinating seeds on either wet blotting paper or towelling paper, certain difficulties are often encountered. Chief of these is the development of root hairs into the surface of the substrata and subsequent difficulty in removing the germinated seeds without injury. A second problem is met with in keeping the seeds in a humid atmosphere most conducive to germination. The method described was designed to eliminate these problems.

Number 300 Cellophane (thin wrapping Cellophane), previously soaked in distilled water for a period of an hour or more to remove the glycerine, is placed wet upon a saturated pad of several sheets of blotting paper, or paper or cloth towelling. The Cellophane presents a very smooth surface to which the root hairs do not adhere.

The seeds are placed on the Cellophane and the blotting pad is placed in the bottom of a miniature greenhouse or other suitable enclosure, such as a bell jar. Thus a moist atmosphere is provided and excessive evaporation from the blotting pad is prevented.

In case seeds are to be germinated for planting purposes, sterilized wet fine sand may be used in place of the Cellophane and blotting pad. In this case, the seeds should be oriented for planting, the radicle in a vertical position. Seeds as large as those of pea, bean and corn may be germinated successfully in this manner.

A particular advantage of using glass-topped boxes or bell jars lies in the fact that the process of germination may be observed without disturbing the seeds. This procedure is good for preparing germinated seeds for the demonstration of root hairs.

ROBERT B. WITHROW
HARRIS M. BENEDICT

PURDUE UNIVERSITY
AGRICULTURAL EXPERIMENT
STATION

SPECIAL ARTICLES

MENINGITIS IN MAN CAUSED BY A FILTERABLE VIRUS

DURING December of 1934 two adult males, W.E. and R.E.S., developed an illness characterized by headache, vomiting, stiff neck and a high cell count, 1,700 and 720 per c.mm., respectively, in the spinal fluid. The cells in the fluid were practically all mononuclear elements. Both patients made a slow uneventful recovery and are now well.

The clinical pictures presented by the patients were almost identical and suggested a virus meningitis. Consequently, spinal fluid from each of them was inoculated intranasally, intraperitoneally and intracerebrally into 6 Swiss albino mice.

Of the 6 mice that received W.E.'s spinal fluid, one died on the third day of a streptococcal infection and was discarded. The remaining 5 mice became sick 6 or 7 days after inoculation. One of them died and was discarded, 2 were allowed to recover and 2 were killed in order to prepare a brain emulsion for intracerebral inoculation of other mice. The second lot of mice became sick about a week after inoculation and some of them were sacrificed for passage. By means of emulsions of bacteriologically sterile brain material injected intracerebrally into mice the active agent has been passed serially through 10 lots of mice and at present small amounts of a 10 per cent. emulsion of infectious brain material kill practically all the mice in 7 days.

In a similar manner an active agent free from bacteria was obtained by the inoculation of R.E.S.'s spinal fluid into Swiss mice. The virus has been passed through 9 sets of mice and reinoculation experiments clearly show that the W.E. and R.E.S. strains are immunologically identical.

Mice inoculated intracerebrally with either strain of virus become sick within 5 to 7 days and lose weight rapidly. Their fur is ruffled. Only a few of them develop signs referable to the central nervous system which consist of irritability and convulsions. No paralyses have been noted. The virus is in the brain, liver, lungs and blood. Mice inoculated intraperi-