

tained by mouse passage, and 0.1 ml of a 1 per cent. suspension of infected mouse lung in mucin or physiological saline was the inoculum used. The hamsters were two to six months old. Sterile 5 per cent. gastric mucin suspensions were prepared according to a technique previously described,<sup>4</sup> and also by a method to be published in a subsequent paper. Both preparations were satisfactory.

The hamsters were anesthetized by the intraperitoneal injection of Nembutal. Since intratracheal inoculations through the mouth with the aid of a catheter were not satisfactory, the trachea was exposed and 0.1 ml of the virus suspension in mucin, or physiological saline, was injected with a 25-gauge needle. The skin was then sutured. In one experiment, six hamsters were injected with 0.1 ml of virus previously neutralized with inactivated rabbit influenza A antiserum.

The animals were sacrificed six to eight days after inoculation, the lungs were removed, and gross pathological changes observed. The data from a few animals with concomitant bacterial infections, as determined by positive cultures on blood agar, were not included.

RESULTS

The results summarized in Table 1 indicate that when influenza A virus was suspended in sterile mucin, and injected intratracheally in hamsters, gross lung lesions developed which were similar to those

TABLE 1  
THE USE OF MUCIN IN THE PRODUCTION OF INFLUENZA VIRUS PNEUMONIA IN HAMSTERS

Inoculum	Number of hamsters	Per cent. with gross lesions	Average number of lobes involved	Extent of lesion
Virus in saline ..	11	9	3	+
Virus in mucin ..	31	71	4	+++
Mucin .....	20	25	1	+
Neutralized virus in mucin .....	6	33	2	+ to ++

(+) Smallest visible lesion to 25 per cent. involvement, (++) 25 to 50 per cent. involvement, (+++) 50 to 75 per cent. involvement, of each infected lobe.

seen in the lungs of mice infected with this strain of influenza virus. Since the incidence and extent of the lesions were markedly reduced, using an inoculum of mucin and influenza A virus neutralized with specific antiserum, it may be concluded that these results were not due to other viruses or bacteria present as contaminants. It should be noted that evidence of consolidation, however slight, is recorded in the table as a gross lesion. This may direct some unwarranted attention to the occurrence of lesions in animals inoculated with mucin alone, or with neutralized virus and mucin, since the lesions in these two groups of animals were small.

A. H. WHEELER  
W. J. NUNGESTER

HYGIENIC LABORATORY,  
UNIVERSITY OF MICHIGAN

SCIENTIFIC APPARATUS AND LABORATORY METHODS

THE PREPARATION OF SODIUM PYRUVATE

PYRUVIC acid, because of its important position in the intermediary metabolism of proteins and carbohydrates, is being used with increasing frequency in physiologic experimentation, including studies on tumor metabolism. The stable sodium salt is the most desirable form for handling this compound. However, the usual method of preparation of sodium

formed. The following simple method, which is based on this fact, permits rapid preparation of any desired amount of the salt. Dissolve 10 ml (12.7 gm) of pyruvic acid (Eastman-498) in 100 ml of alcohol. Redistillation is unnecessary. (A sample which had stood in the laboratory for some weeks and was quite yellow yielded sodium pyruvate which appeared as good as the sample whose analysis is reported below.)

Sodium pyruvate:	Calculated—	C-32.71 per cent.;	H-2.75 per cent.;	Na-20.90 per cent.	
CH <sub>3</sub> ·CO·COONa	Found—	C-	32.63 per cent.;	2.96 per cent.;	21.15 per cent.
		H-	32.58 per cent.;	2.71 per cent.;	20.83 per cent.
		Na-			

pyruvate,<sup>1</sup> involving a very sensitive neutralization of small amounts of freshly distilled aqueous pyruvic acid with dilute alkali, is tedious and bothersome. The yield is often poor and contaminated with brown resinous condensation products.

If the neutralization of pyruvic acid is carried out in alcohol, sodium pyruvate, because of its insolubility, will be removed from the reaction as soon as

The acid is neutralized with alcoholic alkali made by diluting 10 ml of saturated sodium hydroxide with 100 ml of alcohol. The neutralization may be carried out at room temperature and does not have to be exact, for excess alkali is without immediate effect. (A preparation which had been considerably over-titrated showed only traces of yellow condensation products after standing 24 hours.) The sodium pyruvate, which precipitates as a white amorphous powder, is

<sup>1</sup> E. M. Case, *Biochem. Jour.*, 26, 753: 1932.

washed with alcohol and ether, and dried in a vacuum desiccator. Yield, 13.5 gms (85 per cent. of theoretical). Upon recrystallization from 80 per cent. alcohol glistening white plate-like crystals are obtained. No impurities were detected by polarographic analysis by Dr. R. J. Winzler.

WILLIAM V.B. ROBERTSON<sup>2</sup>

BETHESDA, MD.

### DRAWING LAMP FOR CAMERA LUCIDA

ONE of the main difficulties in drawing microscopic objects by the aid of a camera lucida is that of balancing the brilliance of light on the drawing paper with that coming through the microscope. It is generally done by laboriously pushing a lamp around the table or by neutral filters which dim the image.

By the simple expedient of putting a variable resistor in series with the lamp, quick and easy control of illumination on the paper is accomplished. Such a scheme is shown diagrammatically in Figure 1, which indicates the connections of the three electrical components, power plug (P), rheostat (R) and lamp socket (S). In wiring the only caution to observe is that the rheostat turns *clockwise* to increase brightness of the bulb.

On the right in Fig. 2 is an easily made unit adaptable to any set-up of the microscope. It consists of a 3" x 4" x 5" iron shield box (B) to hold the rheostat (R) and act as a base for the 15" gooseneck tubing (T) and socket (S). These boxes have two loose sides which are held in place by screws in each corner. On the side used as a top are mounted the rheostat and a tripod fixture known as a "crowfoot" into which screws the flexible tubing. On the inside of the bottom plate a pound or so of sheet lead is bolted for

Mazda bulbs are made in two ratings 25 and 40 watt (120 volt). The 25-watt bulb is entirely adequate and the rheostat should be 500 ohms for proper dimming, and as it carries a maximum current of 0.25 amps. it must be in the 50 watt class.

For one who uses a binocular microscope and has much drawing to do it is well worth while to build the wooden frame with drawing board (C) and microscope stand in one piece (Fig. 3) which assures that all drawings are at the same magnification; paper can be conveniently fastened down by Scotch tape. The part of the camera lucida which fastens to the microscope is left in place and only the mirror removed so a dust cover can be put over the instrument at night. The gooseneck tubing (T) is fastened by the crowfoot directly to the frame, and the rheostat (R), enclosed by a guard of perforated metal, is mounted conveniently for the drawing hand. The board (C) must be inclined from the horizontal exactly as are the ocular tubes from the vertical to avoid distortion.

It will be noticed that the microscope is slightly elevated by the frame. We have found that this puts the eyepieces in a more comfortable position which eliminates some of the "stooping" associated with microscope work, and Dr. D. H. Linder has taken advantage of this space to insert a small drawer (D) in which to keep lens paper, micrometer-ocular, etc. This stand and lamp, as shown in Fig. 3, will surprise with its convenience anyone used to changing to the monocular, assembling the camera lucida and drawing on a flat table with daylight or an ordinary desk lamp. It is so easy to use that many objects can be sketched "when you see them" rather than waiting until some later time or being mislaid or neglected completely.

EDGAR V. SEELER, JR.

HARVARD UNIVERSITY

### BOOKS RECEIVED

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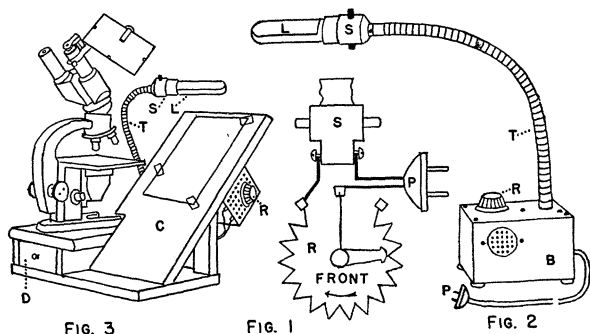


FIG. 3

FIG. 1

FIG. 2

ballast, and ventilation holes are punched in the sides and covered by metal screening. The socket has a push-through switch and holds a tubular half-silvered showcase bulb (L). As this bulb is small it causes less interference with the camera lucida mirror than the usual bulb and reflector of a desk lamp. The

<sup>2</sup> Research fellow, National Cancer Institute, National Institute of Health, U. S. Public Health Service.