Professor Nagler's family and to the President of the University of Iowa.

The meetings and the papers presented illustrate the increasing interest in, and value of, the scientific and practical applications and contacts of geophysics —both nationally and internationally.

JNO. A. FLEMING,
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SCIENTIFIC APPARATUS AND LABORATORY METHODS

A SIMPLE AGITATOR FOR SUBMERGED RESPIROMETERS

SOME time ago there arose in our laboratory the need for a suspending, controlling and agitating device for a set of Barcroft respirometers of the type described by R. W. Gerard.[1] The device designed for this laboratory and now being used in it is illustrated in representative sections in the accompanying

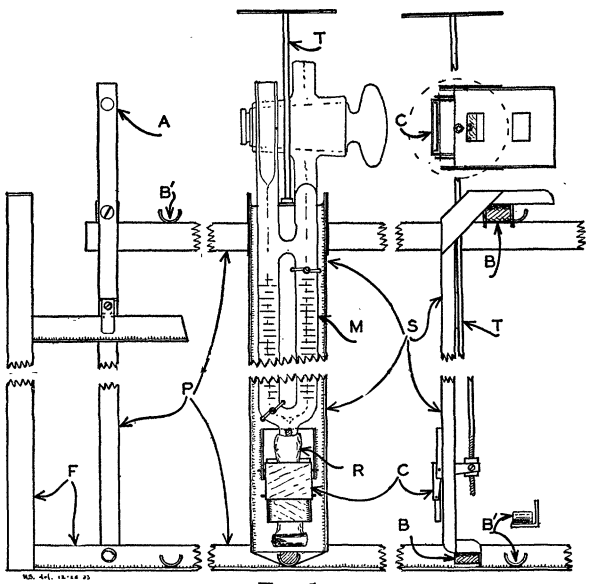

FIG. 1.

figure. Essentially, the hanger for each manometer consists of a strap of metal (S) bent into the shape of an inverted L and properly braced so as to support the glass structure of the manometer (M). A two-piece clamp (C), actuated from above by a threaded rod (T), compresses the manometer reservoir (R) at the lower end of this hanger. The latter has two bearings (B) by means of which it is suspended on the agitating device. These bearings fit into corresponding cup bearings (B′) on the agitating device and permit the removal and replacement of each individual hanger without disturbing the others. The agitating device is essentially a U-shaped frame (F) the sides of which guide, and the lower member of which supports the other three parts of a jointed parallelogram (P) upon which the manometers are rocked in unison. This parallelogram is moved by means of a crank and pulley system connected to one of its upper corners (A). This device can be made in duplicate for use on both sides of a large bath and activated by means of the same pulley system. The cost of the apparatus, excluding the motor and the manometers, is less than $5 and the simplicity of the design renders skilled labor and special tools unnecessary in its construction.

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[1] *Am. Jour. Physiol.*, 1931.

A STAIN FOR DIFFICULT PLANT MATERIAL

RECENTLY some plant material has been encountered which could not be satisfactorily stained by the ordinary procedure. The following version of the Flemming triple stain was worked out for this material and is now being used for most of the cytological work at this laboratory.

Proportions:

1 part —1 per cent. aqueous gentian violet
2 parts—1 " " " safranin
1–4 " —distilled water

Schedule: If a fixative with no chromic acid has been used, slides are soaked in 1 per cent. aqueous chromic acid from one hour to over night, and rinsed through several changes of tap water. They are stained 1 to 24 hours—depending on strength of stain. A dilute stain over a period of 24 hours gives the best results. They are then washed in tap water. Thereafter they are placed for 30 seconds in 1 per cent. iodine-potassium-iodide in 70 per cent. alcohol and washed a few seconds in each of the following:

50 per cent. alcohol (two jars in series)
70 " " "
95 " " " plus picric acid (about 1 gm per 100 cc)
95 " " " " ammonia (8–10 drops per 100 cc)
95 " " "
100 " " "
clove oil plus orange G (0.2 gm per 100 cc)
" " clear
xylol (three jars in series)

The slides may be examined in xylol. Excess safranin may be removed by returning the slide to 100 per cent. alcohol, then back to xylol. Excess gentian violet may be removed by returning the slide to clove oil, then back to xylol.

This stain is extremely selective. Chromosomes in different stages of development take up varying shades of color, usually from light to dark purple.

The spindles become a different shade of purple, the nucleoli red, and the cytoplasm orange-yellow. Anatomical structures are stained the same as with Flemming's triple stain.

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MICRO MOUNTS, REVERSE AND CONVERSE

IN examining the reverse side of microscope mounts, at least two procedures have been resorted to. One is to make mounts thin enough on the reverse side to enable clear vision with a high-power objective. Two such types of mounts have been described in a former issue of SCIENCE.[1] I have used a similar method, mounting my specimens between two cover glasses, one 25 mm square, the other circles 12 to 20 mm in diameter. Use of the smaller covers leaves an area on the large cover for recording the collection number. These mounts were examined on a special holder consisting of the usual micro slide to the face of which were soldered three strips enclosing a 25 mm square. These square mounts were filed in shallow trays as used in England.

The chief objection to this method is that it does not provide for the examination of the reverse side of micro slides received for study from *other* persons and institutions scattered over the United States and abroad. For such examination the second method, already described in SCIENCE,[2] is necessary, and having adopted this method, the first is quite unnecessary.

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SPECIAL ARTICLES

SPONTANEOUS ENCEPHALOMYELITIS OF MICE—A NEW VIRUS DISEASE

DURING the past two years, on numerous occasions, individual mice with flaccid paralysis of the hind legs have been observed among our normal stock. By intracerebral injection of normal mice with a suspension of brain or spinal cord from six affected mice, five strains of the inciting agent have been obtained and propagated in series by passage through mice.

The course of the disease in mice, after intracerebral injection, depends on several factors, of which the strain of the virus and the age of the mice are the most important. The course of the disease, using the strain of virus most extensively studied, is briefly as follows: After an incubation period varying from seven to more than thirty days, a flaccid paralysis of one of the limbs appears. This paralysis usually spreads rapidly until all four limbs are affected. In general it may be stated that the younger the mice, the higher the mortality. Very young mice, less than four weeks of age, usually die without showing signs of paralysis. With increasing age the paralysis rate as well as the mortality rate decreases. Adult mice often show no signs after an intracerebral injection of the virus. A number of these mice, although showing no signs of paralysis, have become infected, a fact which is demonstrated by the results of intracerebral injection of normal mice with a suspension of the spinal cord from these mice, as well as by histopathological studies.

Intranasal instillation of virus is the only other method of producing the infection. This method, however, produces paralysis in only a small percentage of mice. Following intranasal instillation there is often developed a relative immunity to a subsequent intracerebral injection of virus.

The paralysis in surviving mice recedes gradually, but a permanent residual paralysis, usually of the hind legs, is almost invariable. Such mice, however, are virus "carriers," as virus can be recovered from the spinal cord for at least 150 days after injection.

Paralytic mice are immune to a subsequent intracerebral injection of virus. There is some evidence of neutralizing substances being present in the blood. A considerable proportion of mice which have remained well after an intracerebral injection of virus are immune to a second injection.

The virus resists the action of 50 per cent. glycerine at from 2° to 4° C. for at least 150 days. It passes all grades of Berkefeld filters with ease.

The virus of spontaneous mouse encephalomyelitis is not pathogenic for rhesus monkeys. No evidence of any immunological relationship with the virus of human poliomyelitis has been obtained.

The anatomic basis for the symptoms is an acute necrosis of the ganglion cells of the anterior horn of the spinal cord. Isolated ganglion cells of the cerebrum also undergo necrosis. Following the acute necrosis of the ganglion cells, there is a marked neuronophagia. A perivascular infiltration is observed in the cerebrum and spinal cord. Lesions have been observed only in the nervous system, which is the only region where virus has been demonstrated.

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RESPIRATORY TYPES AND PHOTOPERIODISM[1]

WORK was initiated in 1930 upon the use potted apple trees make of carbon dioxide from unmodified

[1] SCIENCE, 78: 2021, 267, September 22, 1933.

[2] SCIENCE, 78: 2015, 128, August 11, 1933.

[1] Published with the approval of the director of the Agricultural Experiment Station.