variation is a continuous decrease with the time. If we keep them, the variation is periodic. Either hypothesis beautifully represents the observations which are used. The unfortunate lack of observations in the periods 1883–1902 and 1902–1924 makes it impossible at present to decide between the two hypotheses. However, by 1941 the velocity will be 299,885 km./sec. if the variation is periodic or 299,735 km./sec. if the variation is a linear decrease with the time. It is to be hoped that those who have been performing velocity experiments will continue their work until this matter is settled.

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[1] NATURE, **120**, 602, Oct. 22, 1927. **133**, 464, Mar. 24, 1934. *Ast. Nach.*, No. 5520; 1927. *Ciel et Terre*, various papers, 1927–1931.
[2] "The Expanding Universe", page 14.

Static Charge on a Galvo-Millivoltmeter

A SOMEWHAT curious state of affairs has recently been brought to light in this Laboratory in connexion with a Unipivot galvo-millivoltmeter. The needle of this instrument, which is used in the determination of *p*H values by the electrometer valve – glass electrode method, was found to behave erratically in respect of reproducing its maximum position. On closer examination it was found that, particularly in the case of certain individual operators, rubbing the glass cover of the instrument with the finger, or even strong finger pressure, produced deflection of the needle sometimes sufficiently violent to lift it from its suspension. Return of the needle, though not exactly to its former position, could usually be effected by tapping the glass.

Neither distortion of the case, nor capacity effects, were present, and breathing on the glass cover was sufficient to restore a normal zero or maximum.

Although the case, in common with other vital parts in the electrical system, is normally earthed, it seems clear that a static charge on the glass is responsible for the phenomenon, and the necessity for bearing this possibility in mind, when cleaning or removing dust becomes necessary with such an instrument, is obvious.

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Purification of Plant Viruses

THE following is a practical method of preparing a purified suspension of any of the 'x' group of plant viruses, from the extracted juice of the diseased plant.

Starting with volume *V* of extracted juice :—

(*a*) *V* is cooled to 0° C. and diluted to 15 *V* with water at 0° C. Carbon dioxide gas is passed through the mixture at 0° C. for 30 minutes. This mixture is then centrifuged rapidly for as short a time as will give a clear straw-coloured supernatant, for example, 15 minutes at 3,000 r.p.m. The precipitate, which contains about one third of the original solids, is discarded.

(*b*) The supernatant is diluted to 200 *V* with water at 35° C. Carbon dioxide gas is passed through the mixture at 35° C. for 15 minutes. This mixture is then centrifuged for a considerable time, for example, 1 hour at 2,000 r.p.m. The supernatant is discarded.

(*c*) The precipitate is suspended in *V* c.c. distilled water at room temperature and centrifuged for a short time, for example, 15 minutes at 3,000 r.p.m. The precipitate is discarded. The supernatant is faintly opalescent but colourless. It contains most of the virus and practically no protein.

In (*a*) the flask is immersed in a freezing mixture. The best results are obtained when only a small amount of ice is formed in the solution, and the temperature during the spinning does not go above 15° C.

In (*b*) cautious use of a micro burner will keep the temperature within half a degree of the optimum.

The long spinning of the large volume in (*b*) is the greatest fault of this method. The length of the spinning required to bring down a precipitate can be shortened to less than half an hour if higher speeds are used ; also by adding a trace of aluminium sulphate, or leaving the mixture in the cold overnight.

The method is a modification of one used by Warburg and Christian (1932)[1] to purify a water-soluble ferment. (The application of the method to virus studies was suggested by Prof. D. Keilin, to whom grateful acknowledgment is due.) The temperatures and dilutions given here have been determined after careful variation of all the constants. With virus 'x' from infected tobacco plants, a final suspension can be produced, which will infect 3 out of 5 *Nicotiana glutinosa* plants at a dilution of 1/50,000 as compared with 4 out of 5 with crude sap at the same dilution.

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[1] *Biochem. Z.*, **254**, 440; 1932.

Inheritance of Habits

Do thought-habits produce a physical change in the organism ? I once asked a friend of mine who is a great experimentalist. He replied : "I don't know." Does any habit produce a physical change ? He again replied : "I don't know." Could he suggest any experiment to ascertain this point ? Once again he replied in the negative. I could see the discipline of science had produced a habit in him which the stimulus of my suggestion was not strong enough to overcome.

Were it not the case, then why do people find it difficult to change from one habit to another ? It is not only difficult but it is often accompanied by a feeling of positive pain. A transformation from one thing to another implies loss or gain of energy ; and this energy must be summoned and given a direction before a change could be produced from one habit to another. Consider, for example, the difficulty many people are now experiencing in assuming the habit of a 24-hour clock.

Can habits be inherited ? For anything to be inherited, the reproductive cells must be affected in a particular way. Experiments have been performed to settle this question. Mice have been trained to thread a maze of a particular configuration, and the offspring of such trained mice have been able to thread the same maze with the least difficulty and