

continuously variable rheostat. The lamp connexions, batteries, and rheostat are contained in a screened tube and box, with the screen earthed to avoid variations due to the adjustment and handling of the rheostat.

A large range of high resistance variation can be obtained by choice of the material of the cell and cathode, by the nature of gas used, or by degree of vacuum. No battery is required, the difference of potential across the cell being merely the difference of potential between the grid and the filament leg to which attachment is made. The apparatus in which use is being made of this variable high resistance is a modification of that described in the *British Journal of Radiology*, March 1930, for detection of the variable electric field of the human body.

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Glasgow, Feb. 25.

The Velocity of Light.

IN NATURE of Oct. 22, 1927, p. 602, I summarised the observational evidence respecting the velocity of light. In *Astronomische Nachrichten*, No. 5530, I pointed out that this evidence is in favour of a decrease of this velocity, which is assumed to be constant owing to considerations of a theoretical order only.

I have just heard of a determination of this 'constant' made by Karolus and Mittelstaedt (*Phys. Zeits.*, vol. 29, pp. 698-702; 1928) in July 1928, that is, since the last determination (299,796 \pm 4 km./sec.) made by Michelson at the beginning of 1926. The average of 755 measures gave 299,778 \pm 20 km./sec. It is remarkable that this is 18 km./sec. less than the value obtained by Michelson, and falls in good alignment with the last three determinations made in the present century:

1902.4	Perrotin	299,901 \pm 84 km./sec.
1924.6	Michelson	299,802 \pm 30 "
1926.0	"	299,796 \pm 4 "
1928.5	{Karolus and {Mittelstaedt }	299,778 \pm 20 "

If the velocity of light is constant, how is it that, *invariably*, new determinations give values which are lower than the last one obtained, the observations distributing themselves so as to put in evidence an excellent linear law of variation, as can be ascertained by plotting the above results. The graph does not show the slightest sign of a tendency to approach asymptotically a horizontal line. It is frankly oblique to the axis of time. There are twenty-two coincidences in favour of a decrease of the velocity of light, while there is not a single one against it.

The velocity of light is affected by magnetism, and the measurements of this 'constant' are performed in a magnetic field of varying intensity, namely, the earth's magnetic field, yet no correction seems to be applied to allow for this variation in the physical conditions in which the experiments are carried out, or in any other which may be present.

Vrkljan has shown (*Zeits. für Phys.*, vol. 63, pp. 688-691; 1930) that a decrease in the velocity of light is not in contradiction with the general theory of relativity. Certainly it is time that the constancy of this velocity should be established beyond doubt on experimental evidence, instead of merely postulated theoretically.

The relatively large error of this new determination prevents it from deciding the question. A redetermination of the 'constant' by Michelson would settle it once for all.

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Mar. 8.

Hydrolysis of Acetone in Ultra-Violet Light.

IN the course of our investigations on the hydrolysis of acetone in ultra-violet light, we have measured the effect of the variation of light intensity on this reaction and found a direct proportionality between incident light intensity and reaction velocity. Two sets of experiments were carried out, in one of which the intensity was varied by means of a rotating sector and in the other by using diaphragms of different apertures. The results, in both cases, give a fairly constant value of the ratio, change/intensity. The detailed results of these experiments and their discussion will be published shortly elsewhere.

We have further observed that when aqueous solutions of acetone are exposed in closed plane-walled quartz vessels to the full light of a quartz mercury lamp, as well as acetic acid, formaldehyde is formed in quantities sufficient to be detected and estimated colorimetrically. Bowen and Watts¹ could not detect any other product except acetic acid under similar conditions. In our opinion, the low quantum efficiency (0.2) found by these investigators for this reaction may be partly due to the formation of formaldehyde. Experiments to confirm this idea and re-determine the quantum efficiency are proceeding and will be reported in due course.

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¹ *Jour. Chem. Soc.*, 129, 1611; 1926.

Measurement of the Electrical Conductivity of Electrolytes.

IN NATURE of Mar. 21, p. 441, M. Lecomte du Noüy outlines improvements in the method commonly used to measure the electrical conductivity of electrolytes. We are particularly interested in this communication, and think it may be worth while to record that we are making a series of such determinations on solutions of phenol in water, using these modifications, but with the further refinement of a Wagner earthing device. We hope to publish results shortly.

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Red Snow in Persia.

ON several occasions I have observed 'red snow' on the mountains in Bakhtiari country, south-west Persia. It usually occurs in patches a couple of yards wide and a score of yards long, lying with normal white snow. To-day (Feb. 14), however, the phenomenon occurred on an entirely different scale, a whole mountain-side being covered with 'red snow'. Two days ago, a heavy fall of snow occurred, lying down to about 6000 ft. above the sea-level. Yesterday was mild and misty, while to-day was misty in the morning but clear in the afternoon. The mist cleared away from above downwards and had dispersed above 5500 ft. above sea-level by 10 A.M. There were a few cloud pennants to be seen infrequently trailing from the higher peaks.

Kuh-i-Javanbin (10,000 ft.) and Kuh-i-Shirgun (9500 ft.) are the two mountains on which the 'red snow' was seen. Both are smooth-topped ridges running north-west and south-east. The south-west flank of each is a dip-slope of Cretaceous limestone now snow-clad. An irregularity at the south-east end of Shirgun has produced an extensive facet facing directly