The temperatures used were 25°, 30°, 35° and 40° C. The number of mutations was estimated by taking four shoots about 10 cm. long from each plant and observing the number of spots and their size. The results are given in Table 1, in the form of the number of mutations per cm. length of stem, of 2 mm. diameter. A correction was made for large spots, since in the coloured areas no more mutations occur. (One clone produced few mutations in the stem epidermis and is excluded from the table.) Altogether 620 mutations were counted.

TABLE 1.

Clone	25°	30°	35°	40°
1	2·89	2·05	1·07	0·54
2	2·92	2·39	1·09	0·60
3	2·75	2·22	0·86	—

There is a consistent, and statistically very significant, apparent reduction in mutation rate with increasing temperature.

It is of interest to consider mutation rate not as a function of time, as is done in Table 1, but of the number of cell divisions. The areas of epidermal cells were measured, and it was found that cell size increased with temperature throughout the range tested, though maximum stem elongation took place at 35°. In Table 2, values from Table 1 have been multiplied by corresponding cell areas; they are also adjusted by a common factor making the means of the two tables equal, for easier comparison.

TABLE 2.

Clone	25°	30°	35°	40°
1	1·70	1·98	1·25	0·96
2	2·42	2·14	1·28	0·71
3	3·45	2·59	0·90	—

These values are proportional to the mutation rate per cell; an analysis of variance of the data on which they are based shows that the effect of higher temperature in reducing mutation rate is still highly significant. Moreover, petals spots, including those from clone 4, though difficult to analyse quantitatively, show the same effect.

At this stage we can offer no explanation for this rather paradoxical result. It is very desirable to know how general it is among mutable genes.

As an example of the kind of complication which is met with in studying the effect of temperature, we wish to place on record that, in Portulaca, higher temperature produces less acid cell sap, as is the case with certain Crassulaceæ. It is conceivable that *p*H influences mutation rate, and temperature effect might thus be indirect; altered acidity is likely to be but one of many physiological conditions changed by temperature.

We hope it may be possible to describe these experiments fully later.

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Determination of *p*H in Wood

IN the course of certain researches in progress at this Laboratory it became necessary to find a satisfactory method of determining potentiometrically the *p*H of the moisture present in wood when the latter is in the air-dry condition, that is, at a moisture content of between approximately 5 and 20 per cent. Most *p*H determinations in the study of wood are applied to aqueous extracts prepared under standard conditions, and whilst the results so obtained are of value for some purposes, we have found that it is only when a wood exerts a relatively strong buffering action that an extract prepared, for example, by leaching 1 gm. of the powdered substance with 20 ml. of distilled water, can have a *p*H approaching closely in numerical value to that of the moisture of condition present in the wood substance prior to extraction.

Species	Moisture content at 60 per cent R.H. (% oven-dry weight)	*Mp*H
Mugongo *Ricinodendron rautenenii* Schinz.	8·14	6·69
Balsa *Ochroma* sp.	6·81	5·54
Beech *Fagus sylvatica* L.	8·93	5·21
Birch *Betula lutea* Michaux	9·65	4·62
Teak heartwood (*Tectona grandis* L.)	7·55	4·50
Oak sapwood *Quercus* sp.	11·11	4·40
Scots pine *Pinus sylvestris* L.	6·21	4·27
Sitka spruce *Picea sitchensis* Carr	10·25	3·98
Douglas fir *Pseudotsuga taxifolia* Brit. Sample (1)	8·70	3·67
Oak heartwood *Quercus* sp. Sample (1)	11·73	3·50
Oak heartwood *Quercus* sp. Sample (2)	10·86	3·16
Douglas fir *Pseudotsuga taxifolia* Brit. Sample (2)	9·77	2·89
Western red cedar *Thuja plicata* D. Don	8·27	2·46

It has been found by one of us (S. A. B.), however, that the *p*H of the water used to extract a sample of wood flour can be so adjusted beforehand that it undergoes no change when mixed in any proportions with the wood substance at room temperature. Thus, in short, the *p*H of the moisture of condition of the wood, which we propose to term the 'moisture *p*H', or simply '*Mp*H', is numerically equal to that of the solution containing free hydrogen ions which, when added to it under the conditions stated, undergoes neither a net loss nor gain of hydrogen ions. *Mp*H values, determined by means of the glass electrode, of samples of a number of wood species are given in the accompanying table.

It is hoped that full details about this new determination and some of its possible applications will be published elsewhere in the near future.

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