by focusing, with a microscope objective, an image of a two-watt Western Union concentrated arc source. The photo-e.m.f. was measured using an electrometer triode. In every case a photo-e.m.f. was observed varying in magnitude and sign from point to point of the layer. The accompanying figure shows the typical variations for 2 mm. of a photoconductive layer of lead sulphide of about 1 micron thickness and 20 × 1 mm. area.

Since the theory is applicable to any substance which may exist as an excess and defect semi-conductor, it was thought that the presence of photovoltaic barriers should be observed in photoconductive layers of substances other than lead sulphide. We are able to report preliminary results on layers of selenium which support the above conclusions. The photovoltaic effects observed in this case show, in general, the same magnitude and type of variation as those described for lead sulphide layers.

We have to thank Mr. J. S. Preston, of the National Physical Laboratory, for the preparation of the layers of selenium.

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[1] Starkiewicz, J., Sosnowski, L., and Simpson, O., *Nature*, **158**, 28 (1946).
[2] Sosnowski, L., Starkiewicz, J., and Simpson, O., *Nature*, **159**, 818 (1947).

Radiant Temperatures of Walls in North–South and East–West Rooms

IN an investigation of indoor climate conditions initiated by the Indoor Climate Committee of the Meteorological Research Council in Palestine in the autumn of 1946 the mean radiant temperatures of walls of dwelling-rooms were (among other factors of the indoor climate) measured by means of the globe thermometer of Vernon. The observations were taken in two newly built houses of similar design, building materials, etc. The only difference between the two houses was in the orientation of the main fronts (longer walls): the main fronts of one house faced north and south, while those of the second one faced east and west. The actual observations were taken on the first floors of these (three-storied) houses. To be more precise:

(1) In the north–south house in a south room, whereby we mean a room (*a*) with a window on its south side; (*b*) communicating on its north side to another room with a window opening to north (the door between the two rooms was kept open during the whole period of observations); (*c*) on the east and west of the room there were other apartments, thus eliminating the direct climatic influence of the east and west fronts of the house.

(2) In the east–west house in an east room, whereby we mean a room the description of which will be obtained from that of the foregoing by substituting east for south and west for north.

The result of the observations was that the mean radiant temperatures of the walls in the east room have a double maximum during the day, one between 9 and 10 a.m. (local time) and the second one between 5 and 6 p.m. This would correspond to a maximum of irradiation by the sun of the east wall in the morning and the west wall in the afternoon. The south room has a single maximum occurring between 2 and 3 p.m.

The morning radiant temperature maximum of the walls in the east room is about $2\frac{1}{2}°$ C., the afternoon maximum about $1\frac{1}{4}°$ C. higher than the instantaneous value of the mean radiant temperature in the south room. On the other hand, the single maximum in the south room is not above the instantaneous value in the east room. The mean radiant temperature of the south room is always below that of the east room.

If the windows be kept shut during the day, the room air temperature in the east room will have a slight local maximum at about 10 a.m. (the observations were taken at the height 1·20 m. above floor), followed by a decrease, and afterwards a fresh and more gradual rise to the afternoon maximum.

The significance of the above is clear for the better orientation of houses in a country with a long and warm summer—a thesis that has been advocated by the above Committee.

I am indebted to the Committee for permission to publish this note.

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Technique of the Analysis of Variance

I AM afraid I disagree with Dr. Vajda's comments[1] on the analysis of variance technique appropriate to two-way tables with unequal frequencies in the different sub-classes. As I pointed out in the paper referred to[2], the expressions for the efficient estimates of the 'main' effects of the two variables are different according as interactions are assumed to exist or not. If interaction is assumed, the efficient estimate for the first variable in a 2 × 2 table, using Vajda's notation, is

$$a_1 = \tfrac{1}{2}\{(x_{11} - x_{21}) + (x_{12} - x_{22})\}.$$

If there is no interaction, it is

$$a_2 = \left\{\frac{n_{11}n_{21}}{n_{11}+n_{21}}(x_{11} - x_{21}) + \frac{n_{12}n_{22}}{n_{12}+n_{22}}(x_{12} - x_{22})\right\} \Big/ \left(\frac{n_{11}n_{21}}{n_{11}+n_{21}} + \frac{n_{12}n_{22}}{n_{12}+n_{22}}\right).$$

It is this latter expression that I derived by the method of fitting constants. (In the case of a 2 × 2 table it can, in fact, be written down directly by considering the variances of $x_{11} - x_{21}$ and $x_{12} - x_{22}$.) The expression for a_1 can, of course, also be derived by fitting constants, including a constant for interaction, though its form is obvious.

If all the sub-class frequencies are equal, the two estimates are identical, and this accounts for the formal simplicity of the analysis of tables with equal sub-class frequencies.

Snedecor[3] made an important further contribution to the subject when he pointed out that this formal simplicity is retained in the case of tables with proportionate sub-class frequencies ($n_{ij} = u_i v_j$), provided the main effect of each variable is re-defined as its average effect over the frequencies actually observed of the other variable instead of its average over equal frequencies of the other variable. In this case the estimate of the first variable is

$$a_3 = \frac{v_1}{v_1+v_2}(x_{11} - x_{21}) + \frac{v_2}{v_1+v_2}(x_{12} - x_{22}).$$

It will be noted that a_2 is identical with a_3 when the frequencies are proportionate.