

A series of limited portions of the ultra-violet spectrum of an iron arc was successively allowed to fall on the powdered sample in a flattened quartz test tube. The blue fluorescence thus excited was photographed on different parts of a Kodak Panatomic film behind a filter to keep out the ultra-violet light. The transparency of the developed film was measured with a barrier layer photo-cell. Taking into account the energy distribution in the spectrum of the iron arc, maxima of the blue fluorescence were found for the following wave-lengths of the exciting light: for synthetic calcium fluoride with  $10^{-3}$  or  $10^{-4}$  europium and in sodium chloride with  $10^{-4}$  europium, all after treatment with radium rays, from 230 to 240  $\mu$ , 260, 280, 350 and 385  $\mu$ ; for natural fluorite from Weardale (purple) practically the same wave-lengths, only, instead of the last-mentioned maximum, one at 400  $\mu$ . For longer wave-lengths the method is not applicable because of the overlapping of exciting and emitted wave-lengths.

Calcium sulphate with  $10^{-2}$  samarium gives after radium treatment for the red  $\text{Sm}^{++}$ -fluorescence, maxima of excitation at 240, 350, 370 and 400  $\mu$ . Treatment of calcium sulphate with  $10^{-3}$  samarium with light of wave-length 240  $\mu$  has the same effect as that with radium rays: the untreated preparation shows, when illuminated with filtered ultra-violet light, only the well-known lines of trivalent samarium; but after prolonged treatment with wave-length 240  $\mu$ , the red and infra-red bands 630 and from 689  $\mu$  to 734  $\mu$  appear on illumination with filtered ultra-violet. In calcium fluoride with europium also the wave-length 240  $\mu$  seems to produce the same effect as radium rays.

Presumably the excitation maxima of shorter wave-length are connected with the formation of excited bivalent rare earth centres (reduction of the trivalent rare earth ions), those of longer wave-length with the excitation of such centres already formed.

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Vienna, July 4.

<sup>1</sup> See the report by K. Prizbram in *Z. Phys.*, **102**, 331 (1936); **107**, 709 (1937); and also *NATURE*, **141**, 970 (1938).

<sup>2</sup> Groot, W. de., *Arch. Neerland.*, *iiia*, **7**, 207 (1924), had already found two regions of excitation in fluorite: below 230  $\mu$  and between 340 and 380  $\mu$ .

### Crystal Structure of Thianthren and Selenanthren

In a recent paper by Cullinane and Plummer<sup>1</sup> on the isomorphous relationships of some analogous organic derivatives of oxygen, sulphur and selenium, we gave the results of some preliminary crystallographic measurements on thianthren and selenanthren (diphenylene disulphide and diphenylene diselenide). The crystallographic measurements have now been completed and an X-ray determination made of the sizes of the unit cells. The results are here given and refer to a different c-axis from that quoted in the paper by Cullinane and Plummer.

The crystallographic measurements show that thianthren and selenanthren, which crystallize in the monoclinic system, are isomorphous. This result is in agreement with the conclusions of Cullinane and Plummer. Our observations also show that the unit cell for thianthren chosen by Prasad, Shanker and Peermohamed<sup>2</sup> is face-centred in the basal plane and is therefore not primitive. This agrees with the remark to that effect made by Cox<sup>3</sup>. Our photographs confirm the assignment of the space-group  $C_{2h}^2$

to thianthren made by Prasad, Shanker and Peermohamed and show that selenanthren also belongs to the same space-group.

Full details of the work will be published elsewhere.

Thianthren:  $a : b : c = 2.37 : 1 : 1.95$ ,  $\beta = 110^\circ 0'$   
 $a = 14.3 \text{ \AA}$ ,  $b = 6.09 \text{ \AA}$ ,  $c = 11.8 \text{ \AA}$ .  
 Selenanthren:  $a : b : c = 2.36 : 1 : 1.97$ ,  $\beta = 110^\circ 20'$   
 $a = 14.5 \text{ \AA}$ ,  $b = 6.21 \text{ \AA}$ ,  $c = 12.1 \text{ \AA}$ .

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<sup>1</sup> Cullinane and Plummer, *J. Chem. Soc.*, 63 (1938).

<sup>2</sup> Prasad, Shanker and Peermohamed, *J. Ind. Chem. Soc.*, **14**, 177 (1937).

<sup>3</sup> Cox, *Chem. Soc. Annual Reports*, **34**, 189 (1937).

### Colchicine and Acenaphthene as Polyploidizing Agents

KOSTOFF<sup>1</sup> has recently directed attention to the similarity in action of colchicine and acenaphthene, and recommended the latter substance for purposes of chromosome doubling. Preliminary tests with acenaphthene used in saturated solutions of liquid media<sup>2</sup> adapted to the observation of mitosis in stamen hairs of *Tradescantia* give no indication that acenaphthene is at all comparable to colchicine as a polyploidizing agent. After 2 and 4½ hours, counts of nuclear stages showed the following percentages:

	Prophases	Prometa-anaphases	Telophases	
Acenaphthene	9	3.7	7	} 2 hours 200 cells
Check	11.8	4.5	9.7	
Acenaphthene	9.4	1.9	7.5	} 4½ hours 100 cells
Check	9.6	1.6	9.6	

Not a single polyploid cell was formed in this experiment, nor were any nuclei observed showing chromosomes in metaphasic condition typical of colchicine. Young plants of marigold, tops of which were immersed for 1-48 hours in culture solution<sup>2</sup> saturated with acenaphthene, showed during the successive week effects distinct from those of colchicine.

Kostoff<sup>3</sup> has meanwhile changed his method of application of acenaphthene. Instead of using saturated solution he now brings crystals into contact with the plant material. Certain phases of the acenaphthene reaction apparently resemble that of colchicine. More work is required before the effects can be compared. Any reversible reaction of the type described by Kostoff, if easily applied, widens the possibilities of inducing somatic changes in clonally reproducible plants.

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<sup>1</sup> Kostoff, D., *C.R.*, U.R.S.S., **19**, 197-199 (1938).

<sup>2</sup> Nebel, B. R., and Ruttle, M. L., *J. Heredity*, **29**, 1-9 (1938).

<sup>3</sup> Kostoff, *NATURE*, **141**, 1144-1145 (1938).

### Effects of Floods in East Norfolk

A RECENT visit to the part of East Norfolk flooded by the sea in February and April of this year was made memorable by a succession of south-westerly gales towards the end of June. The best point from which to see the flood damage was found to