discharge[4]. We suggest tentatively that the potential within which $+\Delta i$ occurs corresponds to the proportional or/and Geiger region. In extending their ranges and as self-quenchers, the role of organic vapours is well known[8]. The ozonizer filled, for example, with *cyclo*hexane vapour was tested for sensitivity to background counts. It begins to 'count' near the potential where $+\Delta i$ sets in. The chief limitation of the ozonizer is that the plateau is not flat. The rareness of $+\Delta i$ in electronegative gases may be ascribed partly to the electron attachment, causing a reduction of the plateau. The recent observation[9] of a large and reversible $+\Delta i$ in an argon–methane counter in the plateau region on irradiation in the visible region supports this analogy.

Essentially similar results are observed under γ-rays; and a like investigation using α-rays is in progress. We wish to express our thanks to Prof. S. S. Joshi, Banaras, Prof. V. N. Thatte and Dr. B. V. Thosar, Nagpur, for guidance and valuable help.

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Two Band Systems of Tungsten Oxide

The spectrum of a high-tension D.C. arc between spectrographically pure tungsten electrodes was photographed in the near infra-red, the visible and the ultra-violet regions using the Steinheil 3-prism-spectrograph with a camera focus of 1,600 mm. Though the spectrograms were largely covered with continuous background, a number of red degraded bands could be recognized and were measured on the Abbe comparator.

As neither sequences nor progressions were readily recognizable, recourse was had to extrapolation of the value of ω_e'' of tungsten oxide from the values of the oxides of neighbouring elements in the periodic table as shown below.

VO 1,012·7		CrO 898·8	
	AsO 967·4		SeO 907·1
CbO 1,002·9		MoO —	
	SbO 817·2		TeO 796·0
TaO 1,161·6		WO 1,060	

Starting with the intense band heads ν 20,799·9 and ν 22,417·8 as (0,0) bands of two different systems and using the value 1,060 obtained above as the probable value of ω_e'', it was possible to construct the two accompanying ($v'v''$) schemes.

Two Systems of Tungsten Oxide

(1)

v' \ v''	0	1,054·9	1	2
0	20,799·9(6)		19,745·0(3)	—
	979·4		981·9	
1	21,779·3(4)		20,726·9(3)	19,679·5(2)
	966·8		960·8	
2	22,746·1(5)		21,687·7(4)	—
			961·1	
3			22,648·8(1)	—

(2)

v' \ v''	0	1057·5	1
0	22,417·8(5)		
	988·3		
1	23,406·1(4)		22,348·6(2)
2			23,336·4(3)
3			24,323·9(6)

A third system with ν 21,227·3 and ν 22,217·8 as the (0,0) and (1,0) bands appear possible; but more cannot be said at this stage.

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Effect of Surface Films on the Twinning of Metal Crystals

In a recent communication, Gilman[1] reports that an electrodeposited layer of copper raises the stress necessary to cause twinning in single crystals of zinc. This result is in accord with a series of observations, to be published shortly, by Dr. S. M. Gumbrell and myself, on the effect of surface condition on the twinning behaviour of cadmium crystals.

Long single crystals, 1 mm. in diameter, were grown by the method of Andrade and Roscoe[2] and cut into several lengths, which were given different surface treatments. The specimens were then tested in tension in a rigid frame apparatus in which the strain was brought about by means of a micrometer screw movement. A Polanyi beam was used for measuring the stress with a high degree of sensitivity. Stress–strain curves were obtained, and the onset of twinning, being accompanied by a sudden drop in stress, was readily detected.

It was found that specimens in which the angle ψ between the tension axis and the basal plane was less than about 3° were not deformed by slip to any measurable extent before twinning occurred. Where ψ was greater than this, appreciable glide preceded twinning. Reproducibility of twinning behaviour was remarkably good in those cases where no slip preceded twinning, but results for specimens which showed appreciable glide were not so consistent. The accompanying graph shows the effect of surface oxidation produced by heating the specimens at 240° C. in oxygen at 50 cm. pressure for different lengths of time, the angle ψ being less than 3° in all cases. By twin stress ratio is meant the ratio of the stress necessary to cause twinning in the oxidized specimen to that necessary for the untreated length of the same crystal. Each point represents the mean of a number of observations. The actual thickness of the oxide layer was not measured; but there is clearly an increase of twin stress with thickness of oxide coat, approaching a limit of about 30 per cent.