

## NEUTRALISATION OF SPACE-CHARGE OF HOT METALS BY POSITIVE IONS OF POTASSIUM

In previous experiments<sup>1</sup> it was observed that high velocity positive ions of mercury did not have any effect on the Space-Charge of a hot filament and thus no change in its thermionic emission was detected when a beam of mercury positive ions was fired on it. The negative results in these experiments were probably due to the low intensity of the Mercury positive ion beam used.

In the present work investigations have been carried out with slow Potassium positive ions of much greater intensity. The apparatus consisted of a thin Tungsten filament surrounded by a Nickel cylinder which served to collect the thermionic electrons from it. The

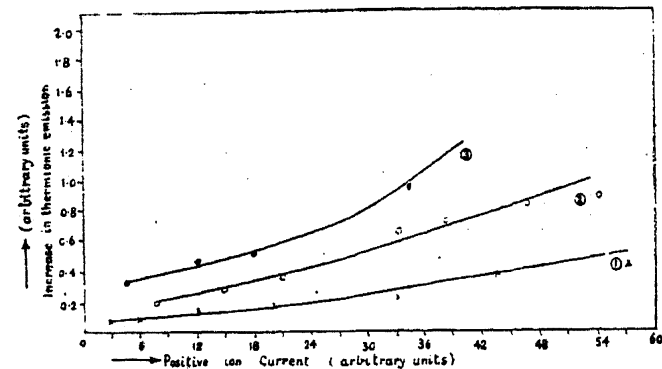


FIG. 1

Filament heating current = 4.4 (arbitrary units)

Anode Voltage = 10.0 volts

Positive ion accelerating voltage:—

Curve 1, 8.0 volts.

Curve 2, 4.0 volts.

Curve 3, 2.0 volts.

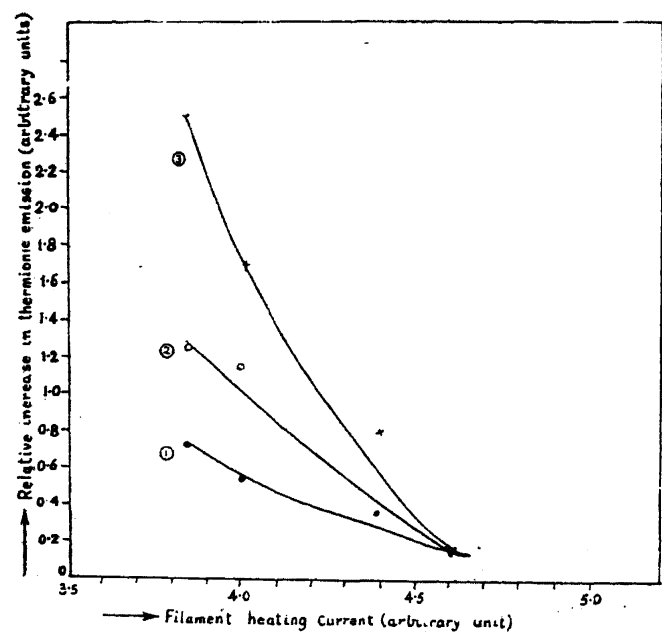


FIG. 2

Positive ion current = 42.0 (arbitrary units)

Anode voltage = 10.0 volts

Positive ion accelerating voltage:—

Curve 1, 8.0 volts.

Curve 2, 4.0 volts.

Curve 3, 2.0 volts.

filament was heated by the secondary of a low tension transformer. A very fine hole was made in the cylinder opposite the filament and a plate was placed outside the cylinder to collect the electrons issuing out of the fine hole. This electron current was measured with a galvanometer of the sensitivity of  $10^{-10}$  amps./mm. The thermionic current to the cylinder was measured with a milliammeter. A beam of positive ions of Potassium was fired on the filament and the variations in the electron current to the plate was observed in the galvanometer for varying intensity of the beam of positive ions of different velocities. The observations were taken at different temperatures of the filament. The results shown in Figs. (1) and (2) are typical of a large number of curves obtained.

The curves in Fig. 1 show that:—

(1) The thermionic emission from the filament at a particular temperature rises almost linearly with the intensity of the positive ion beam incident on the filament.

(2) The increase in the thermionic emission at a particular temperature of the filament is less with ions of greater velocities for the same intensity of the beam.

The curves in Fig. 2 show that:—

(3) For a particular intensity and velocity of positive ions the relative increase in the thermionic emission falls off with increasing temperature of the filament.

The temperature of the filament in these experiments was always below that at which saturation current would be obtained with the anode potential used here, *viz.*, 10 volts.

Details of the experiments will be published elsewhere.

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1. Chaudhri, R. M., Nawaz, S. M., and Aslam, M., *Proceedings, National Institute of Sciences of India*, 1939, 5, 3, 359.

## ON A SPECIES OF SCHISTOSOMA RECORDED FOR THE FIRST TIME FROM THE ELEPHANT

In the course of examination of helminths from a cow-elephant which died recently in the 'Topslip' area of the Coimbatore District, the author was fortunate to meet with *Schistosomes* from the liver. Since there is no record of *Schistosomes* in the elephant either in India or elsewhere in the world, as far as known, opportunity is taken to place this on record.

The collection consisted of about a hundred worms inclusive of males and females and in a bad state of preservation as they were all picked up, dead. Attempts at a morphological study indicate that the specimen differs from all known species of the genus. Though a correct identity of the worm together with a morphological description will form the matter for a future communication the following general features noticed are mentioned here:—

*Males*: Fairly large sized; suckers fleshy and well-developed; cuticle covered with coarse tubercles on the dorsal surface; edges