

greater than unity and accords well with the values found for SiO (0.25 A.) and for GeO (0.15 A.)<sup>1</sup>.

Finally, it is of interest to compare the spectroscopic data for SiS in its ground-state with those<sup>6</sup> for P<sub>2</sub>, which has the same total number of extra-nuclear electrons ( $n = 30$ ).

	State	$\omega_e$	$x_e\omega_e$	$B_e$	$\tau_e$	$a_e$
SIS	$^1\Sigma$	749.5	2.56	0.3037	1.928	0.0015 <sub>6</sub>
P <sub>2</sub>	$^1\Sigma$	780.4	2.80	0.3046	1.890	0.00165

The constants for the two molecules are seen to be remarkably close. The similarity in properties of the 14-electron molecules CO and N<sub>2</sub> has, however, been recognized for some time (for example, Kronig<sup>7</sup>), and examination of the data for the molecules with 22 electrons, CS, SiO and PN<sup>1,8</sup>, reveals an analogous situation. Further, such data as are yet available suggest a close similarity in the properties of other sets of isoelectronic molecules belonging to these groups of the Periodic Table<sup>1</sup>. These relations can scarcely be fortuitous, but it is hoped to extend and perhaps confirm them by examination of other molecules of these groups.

R. F. BARROW.

Physical Chemistry Laboratory,  
Oxford.  
July 28.

<sup>1</sup> Discussion on Band Spectra, *Proc. Phys. Soc.*, **56**, 204 (1944).

<sup>2</sup> Barrow, R. F., and Jevons, W., *Nature*, **141**, 833 (1938).

<sup>3</sup> Barrow, R. F., and Jevons, W., *Proc. Roy. Soc., A*, **169**, 45 (1938).

<sup>4</sup> Saper, P. G., *Phys. Rev.*, **42**, 498 (1932).

<sup>5</sup> Schomaker, V., and Stevenson, D. P., *J. Amer. Chem. Soc.*, **63**, 37 (1941).

<sup>6</sup> Herzberg, G., "Molecular Spectra and Molecular Structure. I. Diatomic Molecules" (New York: Prentice-Hall, 1939).

<sup>7</sup> Kronig, R. de L., "Optical Basis of the Theory of Valency" (Cambridge, 1935).

## Banded Meson Spectrum and the Rossi Second Maximum

CHANDRASHEKHAR AIYA<sup>1</sup> has recently reported the interesting result that there is a discontinuity in the meson absorption curve as measured by Bhabha's method, when the total lead thickness is about 21 cm. He suggests that this has been brought out because of the special arrangement of counters shown in his communication. Bhabha<sup>2</sup> has also mentioned that by his arrangement of splitting lead and placing it between a tray of anti-coincidence counters actuated by showers, it should be possible to study much more accurately the range spectrum of mesons.

Though Bhabha has not indicated where additional lead is to be placed in order to study the longer range mesons, it is clear that so long as there is lead at III (see Aiya's communication) below the anti-coincidence counters, the above view is incorrect and the method cannot furnish any new information about the range spectrum. The range of mesons measured is determined by the total lead thickness, and not only by the thickness of lead above the shower-detecting tray. Further, Aiya's procedure of placing lead on top in position I is open to objections from the point of view of determining the meson spectrum. In the first place the efficacy of the optimum thickness of lead in position II in order to produce the maximum number of showers is lost as soon as additional lead is placed in position I, and in effect the arrangement nullifies the basic idea put forward by Bhabha. Besides this, the net result of Aiya's procedure is to super-

impose on the meson absorption curve a Rossi curve, to be subtracted by virtue of the anti-coincidence arrangement, which rather complicates the interpretation in regard to the range spectrum.

If one does want to get a more accurate measurement of the range spectrum of mesons by preventing the effect of the secondary particles that might be produced after the mesons are stopped, one should keep a tray of anti-coincidence counters actuated by showers right at the bottom of the lead. Or better still, in order also to avoid high-energy electrons, there should be another tray after a lead thickness from the top corresponding to the maximum of the Rossi curve.

If what Aiya gets has anything to do with a banded meson spectrum, one should get it at least equally well with a straightforward counter telescope without any anti-coincidence arrangement. It seems, however, more likely that the effect is related to the second maximum of the Rossi curve. The presence of lead below the shower-detecting tray has the effect of discriminating against electronic showers, and this is probably the reason why the fall in the absorption curve due to the second maximum showers is so abrupt. Further, the fact that the fall is maintained for greater thickness of lead tends to show that the maximum is flat. This point would indeed be more clearly demonstrated if fourfold coincidences 123(45) were measured to give directly the Rossi curve for hard showers.

VIKRAM SARABHAI.

Department of Physics,  
Indian Institute of Science,  
Bangalore.  
July 13.

<sup>1</sup> Aiya, S. V. C., *Nature*, **153**, 375 (1944).

<sup>2</sup> Bhabha, *Proc. Ind. Acad. Sci., A*, **19**, 23 (1944).

## Importance of Film Records

MR. OLIVER BELL, in *Nature* of August 12, suggests that the British Film Institute might "convene a Conference to obtain expressions of opinion" on the important question of the preservation and circulation of privately made films.

The Medical Committee of the Scientific Film Association has already issued a *questionnaire* to collect data about medical films with the view of raising funds to preserve those of value and, where necessary, adding titles or commentaries. It is hoped eventually to make arrangements for central distribution.

Although the first steps have been taken in the medical field, the Association is equally anxious to obtain information about all privately made scientific and technical films, and is already taking steps to send out a similar *questionnaire* to industrial firms and scientific institutions. It is also collecting information about all films suitable for technical training purposes with the view of the publication of catalogues and hand-lists of these films.

MICHAEL MICHAELIS.  
(Hon. Secretary.)

Scientific Film Association,  
c/o The Royal Photographic Society,  
16 Princes Gate,  
S.W.7.