It will be noted that, under the conditions of our tests, azoxybenzene and benzyl benzoate were the only compounds with toxicity to both summer eggs and adult females comparable to that of azobenzene. Diphenyl sulphone was more toxic to the egg stage than any of the other compounds tested.

Further details of this and related work will be published elsewhere.

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Height of Meson Formation

In an earlier publication[1], it was reported that the intensity of cosmic rays appears to be closely related with the height of the 7·5-cm. mercury pressure-level. It was found that the correlation of cosmic-ray intensity at constant atmospheric pressure with the height of lower pressure-levels is rather low, though gradually increasing with height. When the 7·5-cm. pressure-level is chosen—the highest for which sufficient meteorological data were then available—this correlation reaches the value − 0·67. On the basis of the instability of the meson and by assuming that the bulk of the penetrating component originates at this presure-level, the value 18·6 km. was obtained for the mean range of mesons. In support of this hypothesis is the fact that if we take for the mass 180 m_e and for the average momentum of the mesons along their path down to sea-level the value 2,800 MeV./c. given by Rossi[2], then we have for the rest-life the value $2{\cdot}04 \times 10^{-6}$ sec., which agrees with the one generally accepted.

A study of the results obtained for the effect of ground temperature on cosmic-ray intensity in different parts of the world has now been made. It appears from this study that the mean value of the temperature coefficient α_1 obtained by using variations from day to day is about half the value, α_2, obtained by the use of variations from month to month. In addition to this it is known that α_1 shows a marked seasonal change[4].

Using upper-air data kindly supplied by the Meteorological Office, I have found that the difference between α_1 and α_2, as well as the seasonal change of α_1, for which so far as I know no explanation has been offered, can be accounted for as an effect of meson decay if we assume as before that mesons originate at the 7·5-cm. pressure-level, and take 18·6 km. for the mean range. The twelve-monthly variation in cosmic-ray intensity as obtained by Forbush[5] appears to be fairly well explained also by the same hypothesis.

We might therefore conclude from these results that the bulk of mesons is generated at the 7·5-cm. mercury pressure-level.

To see, however, what the results would be if a higher pressure-level had been assumed for the layer of meson formation, I have taken the 3-cm. pressure-level, the highest for which sufficient meteorological data are now available.

	α_1	α_2	12-monthly variation amplitude
Observed values . . .	−0·10%	−0·18%	1·43%
From 7·5 cm. Hg pressure-level .	−0·10	−0·24	1·65
,, 3·0 ,, ,, ,, .	−0·15	−0·43	2·40

The accompanying table compares the results so obtained with the previous results.

It can be seen that the hypothesis of meson formation at the 3-cm. pressure-level leads to values which are roughly fifty per cent higher than those for the 7·5 cm. mercury pressure-level. To reconcile them with the experimental results, we should clearly have to take for the mean range of mesons a value of 28 km., a fifty per cent increase; but this value, together with the fact that in this case we should have to take for the average momentum of the mesons along their path[6] 2,100 MeV./c., would lead to a rest-life of $4{\cdot}0 \times 10^{-6}$ sec., a 100 per cent increase over the accepted value.

The conclusion appears, therefore, to be that the bulk of mesons is generated at, or little above, the 7·5-cm. pressure-level, at the height of the maximum of the Pfotzer curve for the intensity of the total radiation.

If the average layer for meson formation lies at that height, it follows that the intensity of the meson component should be decreasing at the 3-cm. mercury pressure-level (22 km.). On the other hand, the experimental result of Schein, Jesse and Wollan[7] shows that the hard component increases gradually up to the height of 2 cm. mercury pressure reached in their experiment. The two results, however, are not necessarily mutually exclusive if, as generally supposed, the mesons are formed by primary protons the penetrating power of which is not too different from that of the hard component. The intensity of the primary protons should increase gradually with height.

A complete account of this investigation is being sent to the Physical Society of London.

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A Solar Noise Outburst at 600 Mc./s. and 1,200 Mc./s.

Simultaneous records of solar radiation at 200 Mc./s., 600 Mc./s. and 1,200 Mc./s. have been made at this laboratory for approximately two hours per day since August 18, 1947. In general, the 200 Mc./s. radiation is similar in character to that described by McCready, Pawsey and Payne-Scott[1], showing a considerable number of short bursts and an increase in general level as some sun-spots cross the meridian. The 600 and 1,200 Mc./s. records, on the other hand, show almost a complete absence of bursts, the level remaining fairly constant for any one day. The radiation received when the sun is almost free from sunspots corresponds to a solar black-body temperature of 0·5 million degrees