TABLE I

*Effect of coumarin in different concentrations on the growth of excised maize stem tissue through 20 hours period of incubation*

| | Initial values | Concentrations of coumarin, in p.p.m. | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 0 Control | 10 | 50 | 100 | 250 | 500 | 1000 |
| Fresh weight, mg. .. | 100·0 | 117·1 | 120·5 | 121·5 | 128·2 | 136·7 | 137·0 | 117·0 |
| Increase of fresh weight, in % .. | .. | 100 | 120 | 126 | 165 | 215 | 216 | 96 |
| Dry matter, mg. .. | 5·97 | 5·93 | 6·14 | 6·11 | 6·10 | 5·86 | 5·54 | 5·23 |
| Change of dry matter, mg. .. | .. | −0·04 | +0·21 | +0·18 | +0·07 | −0·11 | −0·43 | −0·74 |
| $\frac{\text{Dry matter}}{\text{fresh weight}} \times 100$ | 5·97 | 5·06 | 5·10 | 5·03 | 4·76 | 4·29 | 4·05 | 4·44 |

All values are average of 6–8 repetitions.

of weight equals 0·04 mg. In the same time in solutions 10, 50 and 100 p.p.m. of coumarin dry matter increases by 0·21 mg., 0·18 mg., and 0·07 mg., respectively, and in more concentrated solutions it significantly decreases (*see* Table I).

Because the rise of fresh weight is accompanied by the decrease in dry matter, it might be concluded that stimulation of growth caused by coumarin is caused—partly at least—by acceleration of water absorption by sections. The increase in dry matter in solutions 10-100 p.p.m. is not clear; but the significant decrease of dry matter at 250 and 500 p.p.m. may be the result of simultaneous stimulation of respiratory activity of tested sections induced by coumarin and more rapid dissimilation of sugars on this way (results not yet published)—solution of 1,000 p.p.m. of coumarin probably additionally kills the tissue and this leads to diffusion of cellular components to the surrounding fluid.

In order to obtain some evidence concerning the mechanism of the growth-promoting activity of coumarin described we performed comparative experiments with indole acetic acid and gibberellin. While the details of these will be published elsewhere, here it is necessary only to say that our results are similar to those reported by Neumann[9] for sunflower hypocotyls and it may be concluded that the nature of coumarin action in promoting the growth of excised maize stem sections differs from that of IAA and GA, but it is doubtful whether coumarin may be named an auxin.

1. Klebs, A., *Die Bedingungen der Fortpflanzung bei einigen Algæ und Pflanzen*, Jena, 1896.
2. Sigmund, W., *Biochem Z.*, 1914, **62**, 339.
3. Kuhn, R., Jerckel, D, Moewus, F., Moller, E. F. und Lettre, H., *Naturwiss.*, 1943. **31**, 468.
4. Evenari, M., *Symp. Soc. Exp. Biol.*, 1957, No. 11, 21.
5. Grace, N. H., *Canad. J. Res.*, 1938, **16 C**, 143.
6. Thimann, K. V. and Bonner, W. D., *Proc. U.S. Natl. Acad. Sci.*, 1949, **35**, 272.
7. Gantzer, E., *Planta*, 1960, **55**, 235.
8. Neumann, J., *Science*, 1959, **129**, 1675.
9. —, *Physiol. Plantarum*, 1960, **12**, 328.
10. Guttenberg, H. und Beythien, A., *Planta*, 1952, **40**, 36.
11. Blaim, K., *J. Exp. Botany*, 1960, **11**, 377.
12. Knypl, J. S., *Naturwiss.*, 1960, **47**, 524.

## NUCLEI FOR RAIN FORMATION

INTERESTING evidence has been obtained on the possible origin of the minute, mysterious, and so far, unidentified particles whose presence in the atmosphere is vital to the formation of rain from supercooled cloud. This has resulted from a study of samples collected at high altitudes by U-2 aircraft operated by the U.S. Air Force from a base near Sale, Victoria. Thanks to the generous co-operation of the U.S. authorities, special dust-collecting filters were fitted to the U-2 aircraft. Samples of dust present at heights of 50,000–60,000 feet were obtained from ocean areas well to the south of Australia.

The results show unmistakably that substantial numbers of particles occur at these high altitudes—very many more than can be accounted for if they all come from the Earth's surface. Support is thus given to a theory first advanced by Dr. E. G. Bowen in 1953 that an important source of these particles is the meteor dust which the earth picks up, in the course of its annual journey round the Sun, as it intersects the orbits of the various well-known streams of meteors. This meteoritic dust takes some 30 days to sink to the cloud-bearing levels of the atmosphere, and stimulates heavy rainfall when it arrives there if meteorological conditions happen to be favourable.