attention of workers who may be concerned with these snails to the normal practice of adhering to existing nomenclature while an application is before the Commission. Thus, until a decision has been given, the generic name used for the African intermediate hosts of *Schistosoma mansoni* should be *Biomphalaria* and for the South American hosts either *Australorbis* or *Tropicorbis*.

C. A. Wright

British Museum (Natural History),
Cromwell Road,
London, S.W.7. Jan. 5.

[1] Hubendick, B., *Trans. Zool. Soc. Lond.*, **28**, (6), 453 (1955).

Effect of Gamma-Radiation on Weeds

Considerable data are now available on the radiosensitivity of cultivated plants[1,2], but very little is known about the tolerance of wild species. We have investigated the doses of γ-radiation needed to prevent weed seeds from growing. The seeds were stored at 32 per cent relative humidity and irradiated in air with a range of doses from 0 to 100,000 rads of γ-radiation from cobalt-60. They were then planted in steam-sterilized soil and the number of plants arriving at maturity were counted. *LD*50 values for some common species of arable weeds are listed in Table 1.

Table 1. *LD*50 Doses for Arable Weeds

Species	Chromosome number (ref. 3)	Approximate *LD*50 (rads)
Plantago major	12	10,000
Anisantha sterilis	14	5,000
Alopecurus agrestis	14	20,000
Papaver rhoeas	14	30,000
Medicago lupulina	16 or 32	80,000
Brassica nigra	16	100,000
Atriplex patula	18	10,000
Anthemis arvensis	18	20,000
Raphanus raphanistrum	18	20,000
Sinapis arvensis	18	100,000
Veronica persica	28	>100,000
Galeopsis tetrahit	32	10,000
Sonchus oleraceus	32	10,000
Capsella bursa-pastoris	32	100,000
Polyganum convolvulus	40	30,000
Senecio vulgaris	40	80,000
Rumex obtusifolius	40	100,000
Avena fatua	42	20,000
Avena ludoviciana	42	20,000
Euphorbia helioscopia	42	20,000
Papaver dubium	42	30,000
Stellaria media	42	60,000
Galium aparine	44, 66 or 88	80,000
Cerastium vulgatum	144	80,000

Fig. 1 shows the effects of radiation on *Alopecurus agrestis* planted at a rate of 50 seeds per box. Several characteristic radiation effects were observed. Germination was not related to survival, as irradiated seedlings were generally weaker than controls, and often had distorted first leaves. Seedlings which survived matured later than controls but were not obviously distinguishable otherwise: induced sterility was frequently noted. The *LD*50 doses could not be correlated with any simple character such as chromosome number, though all plants with high chromosome numbers were always radioresistant. The species studied fall into two groups, those with *LD*50 doses less than 30,000 rads and those with *LD*50 doses, greater than 60,000 rads. Apart from *Raphanus* all the crucifers examined come in the second group and the four grasses in the first. *Anisantha sterilis* is remarkably radiosensitive, whereas *Veronica persica* must be one of the most radioresistant plants known.

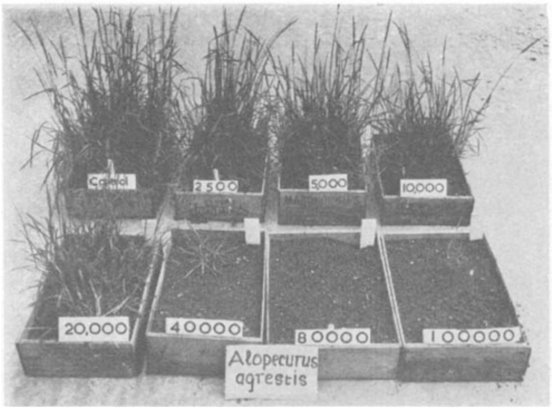

Fig. 1

The results obtained indicate that arable soils need treatment with at least 100,000 rads of γ-radiation to inhibit weed growth effectively. This treatment would sterilize any insects[4], or nematodes[5] present in the soil, and would probably destroy a high percentage of the bacteria[6,7] and fungi[7,8].

We wish to thank Mr. I. M. Rorison for supplying the seeds of *Papaver rhoeas* used in this work.

H. J. M. Bowen
S. R. Smith

Wantage Radiation Laboratory,
Grove, Berks.

[1] Gustafsson, Å., *Hereditas*, **30**, 165 (1944).
[2] Sparrow, A. H., and Christensen, E., *Science*, **118**, 697 (1953).
[3] Clapham, A. R., Tutin, T. G., and Warburg, E. F., "Flora of the British Isles" (Cambridge, 1950).
[4] Cornwell, P. B., Crook, L. J., and Bull, J. O., *Nature*, **179**, 670 (1957).
[5] Wood, F. C., and Goodey, J. B., *Nature*, **180**, 760 (1957).
[6] Dunn, C. G., *Sewage and Industrial Wastes*, **25**, 1277 (1953).
[7] Dunn, C. G., Campbell, W. L., Fram, H., and Hutchins, A., *J. App. Phys.*, **19**, 605 (1948).
[8] Zuckerman, B. M., *Phytopathol.*, **47**, 361 (1957).

Seasonal Changes in the Brain-case of the Common Shrew (*Sorex araneus* L.)

It is well known that shrews of the genus *Sorex* undergo a striking seasonal fluctuation in average weight and length of body[1]. This is mainly brought about by the annual turnover of the population and the rapid spring growth associated with sexual maturation. An additional contributory factor is the decrease in weight of the sub-adults as the winter of their year of birth approaches. This has been detected in large field samples of *S. araneus*[2,3], *S. fumeus*[4] and *S. vagrans*[5].

It was completely unsuspected, until discovered by Dehnel[3], that the autumnal depression in size of body was accompanied by a shrinkage in the size of the skull, the most striking change occurring in depth of the brain-case. Cabon[6] found a similar seasonal fluctuation in brain-case depth in *S. minutus*, and established that this was associated with changes in brain volume. The same seasonal change has been demonstrated in Polish *Neomys fodiens*[7], and in a collection of north German *S. araneus* in the Berlin Museum[8].

We were not completely satisfied that differences in depth of brain-case, of the order shown by Dehnel and his associates, could not be due to chance and the inevitable errors incurred with calipers, particularly as the samples for the crucial months were small.