I raised plants from hybrid seeds *N. rustica* × *tabacum* as well as from the pure parental species under equal environmental conditions and the plants were measured at the end of their florescence period (October 8th). It was found that from exceedingly small embryos, very vigorous F_1 hybrids have developed.

I also included in the experiment the amphidiploid *N. rustica* – *tabacum* plants (2n = 96). They also were much larger in size than the parental forms, but smaller than the F_1 hybrids (Table II). It should be mentioned here that amphidiploid *N. rustica* – *tabacum* is not constant (Kostoff, 1937) because it forms quadrivalents, trivalents and univalents during the meiosis which accounts for its greater variability ($\sigma = 3{\cdot}7$) no matter that for the experiment uniform seedlings were selected, which were morphologically like F_1 hybrids.

TABLE II.

The Size of the Parental Plants and the Hybrids in cm.

No.	Species and hybrids	Somatic chromosomes	n	M	σ
1	*Nicotiana rustica* ..	48	30	82·8	2·9
2	*Nicotiana tabacum* ..	48	30	96·2	3·0
3	F_1 hybrid *N. rustica* × *tabacum* ..	48	9	148·5	2·9
4	Amphidiploid *N. rustica–tabacum*	96	20	128·9	3·7

Hybrid embryos in our case are smaller than those of either parents, because their physiology in general and the physiology of development in particular, is different from that of the maternal plant. The hybrid embryos *N. rustica* × *tabacum* are somewhat foreign for the maternal plant *N. rustica* having 50 per cent. of its genetic nature from *N. tabacum*. If the hybrid embryos were not grown on maternal plant they probably would not be as small as they really were. The reactivity of the maternal organism might also suppress somewhat the hybrid embryos in some respects, the latter being somewhat foreign for the mother (*cf.* Kostoff, 1930).

These ideas were inferred on the basis of the relative size of the normal embryos, hybrid embryos grown in *N. rustica* organism, and the hybrid embryos that develop in the amphidiploids, the latter being considerably larger than those grown in *N. rustica* organism, no matter that they have about the same genetic constitution. It seems that the differences in size of amphidiploid embryos and F_1 embryos are not exclusively due to the polyploid nature of the former.

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The Hayes Radiometer as a Fog Signal.

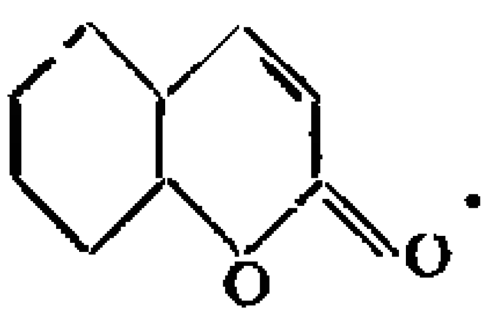
FOG, shipping's deadliest enemy, appears one step nearer defeat with the announcement of successful heavy weather signalling by means of the Hayes Radiometer, originally invented as an extremely sensitive device for measuring heat radiation. Its inventor, Hammond V. Hayes of Boston, reports in the September, 1937, *Review of Scientific Instruments*. The instrument makes practical the long hoped-for means of signalling by use of heat radiation instead of light. Heat rays penetrate foggy and thick atmosphere much more strongly than does light. Boston harbour during the last winter was the trial ground for the radiometer, which is being improved as a result of the first experiments. Signals were sent successfully a distance of more than a mile and a half on days when visibility was so poor that objects situated much nearer than the heat source could not be picked out.

—*Sci. Serv., Sept.* 14, 1937.

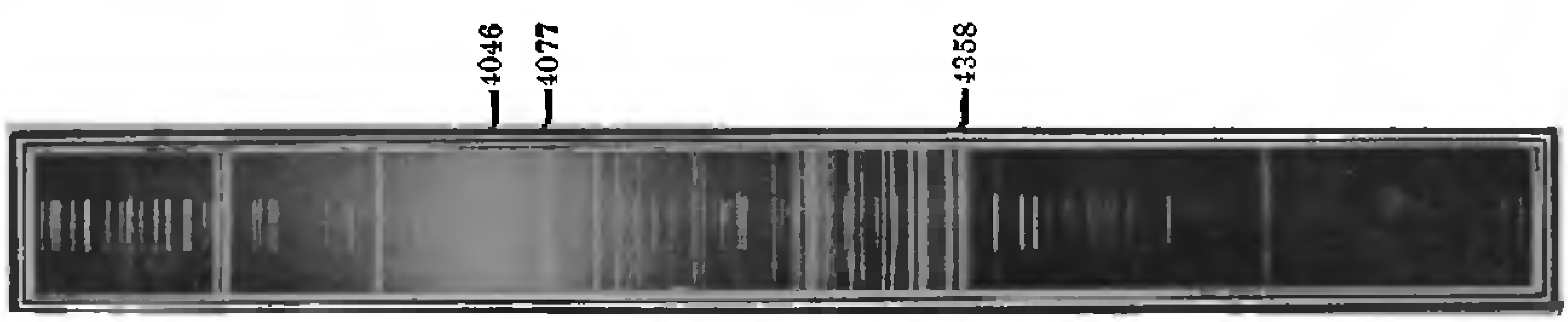
LETTERS TO THE EDITOR.

The Raman Spectrum of Coumarin.

An important class of organic compounds whose Raman spectra have not been hitherto investigated is the one containing the pyrone ring. Coumarin or benzo-α-pyrone is typical of this group and has a structure



. In the course of an investigation of the nature of the low frequency oscillations in a large number of organic substances, I have obtained an intense Raman spectrum rich in lines, for crystalline coumarin, which is reproduced below.



The Raman Spectrum of Coumarin.

The Raman frequencies recorded are the following :—34 (2), 50 (4), 65 (1), 83 (3), 101 (3), 445 (6), 485 (2), 522 (3), 726 (7), 760 (4), 889 (3), 950 (1), 993 (2), 1030 (7), 1045 (0), 1098 (6), 1120 (7), 1152 (6), 1173 (8), 1186 (6), 1203 (1), 1228 (6), 1259 (4), 1324 (8*b*), 1361 (6), 1396 (3), 1415 (3), 1451 (7), 1483 (7), 1562 (10), 1595 (10), 1623 (9), 1709 (8), 1729 (6), 1982 (1), 2013 (0), 2234 (0), 2280 (1), 2343 (1*b*), 2470 (0), 2557 (0*b*), 2648 (2*b*), 2703 (0), 2721 (1), 2730 (0), 2826 (0), 2879 (1*b*), 2932 (0), 2987 (2), 3045 (8), 3063 (3), 3125 (3), 3149 (0), and 3197 (1) cm.$^{-1}$ The numbers within the brackets indicate visual estimates of the intensities of the lines. The exciting lines are 4046 and 4077 Å.U., and the 4358 radiations of the mercury arc were almost completely cut off by means of a filter of iodine in carbon tetrachloride.

The following characteristic features of the spectrum may be mentioned :—

1. Though organic compounds give in general only poor spectra in the crystalline state, coumarin has yielded a remarkably intense spectrum with a host of lines even in regions where they are difficult to observe even in liquid state.

2. The five low frequency lines at 34, 50, 65, 83 and 101 cm.$^{-1}$ which appear as a wing in the molten liquid, are intense, fairly sharp and well separated.

3. The C=O and C=C frequencies are split up into doublets, *viz.*, 1595 and 1623, and 1709 and 1729 cm.$^{-1}$ respectively, having nearly the same intensity.

4. There is a large number of intense lines in the region 1000 to 1500 cm.$^{-1}$ which are probably due to the rings in the molecule.

5. The characteristic frequencies of benzene and naphthalene molecules appear