TABLE 2. SEASONAL CHANGES IN PERCENTAGE OF HETEROZYGOTES FOR TWO DIFFERENT INVERSIONS IN POPULATION II (BOTANICAL GARDEN).

Inversion	May	June	July
II-1.	33·7	44·0	52·2
IV-1.	14·0	1·2	1·6

In future investigations we intend to ascertain the behaviour of all the principal inversions during the seasonal cycle.

Elsewhere[3] we have shown the marked difference in inversion frequency between urban and rural populations in *D. funebris*. It is of great interest to find that no significant seasonal changes in inversion frequencies occur in the rural populations studied by us at Kropotovo, 115 km. south-east of Moscow (Table 3).

TABLE 3. SEASONAL CHANGES IN PERCENTAGE OF HETEROZYGOTES FOR THREE INVERSIONS (II.1, II.2, IV.1) IN A RURAL POPULATION (KROPOTOVO).

	May	June–July	August	September	October	Average
%	3·4	0·1	1·7	0·8	1·7	1·26
Number examined	29	234	530	255	238	1286

The fact that urban populations of *D. funebris* exhibit seasonal cycles of inversion frequency, while rural populations do not, demonstrates the existence of one of the genetic reactions to environment which have led to the evolutionary stabilization of genetically divergent urban and rural races of this species.

The above facts not merely demonstrate that natural selection operates to modify the genetic structure of wild populations in relation to environment and to annual reproductive cycle, but also (contrary to the frequently expressed view that evolution is an extremely slow process) that it operates with great rapidity.

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[1] Dubinin, Sokolov and Tiniakov, *Biol. Zhurn.*, **6**, 1007 (1937).
[2] Dobzhansky, *Genet.*, **28**, 162 (1943).
[3] Dubinin and Tiniakov, "Structural Variability of Chromosomes in Urban and Rural Populations" (in the press).

Wind Measurements at 30 Km.

AN opportunity has recently occurred of making a series of measurements of the velocity and direction of the wind at a height of 30 km. Previous determinations of the wind at great heights have generally consisted of a few individual observations; but in the present instance an extended series of measurements has shown a striking annual variation of the wind in this region.

The measurements were made by following with theodolites the drift of smoke puffs produced by the bursting of smoke shells which were fired upwards from a high-velocity gun in south-east England. Thirty-five determinations were carried out at fairly regular intervals between February 1944 and May 1945.

The results show clearly that during summer the wind at a height of 30 km. is mainly easterly, whereas during winter it has a strong westerly component. The change-over takes place about April and October. In summer the direction varies between about north-east and south-east, and in winter between about south-west and north-west. Over the period covered by the observations, the mean velocity in summer was about 12 metres per second and in winter 37 metres per second. The greatest velocity observed was 66 metres per second from a direction 285° (true).

This annual variation in the direction of the wind at this height confirms the deduction made by the late Dr. F. J. W. Whipple from a study of the audibility of explosions at a distance.

A full description of the recent observations will be published shortly in a paper now being prepared by Flight-Lieutenant R. J. Murgatroyd, the meteorological officer associated with the investigation.

N. K. JOHNSON.

Meteorological Office,
Air Ministry. Nov. 21.

Flow Through Very Small Channels

A 'NEON' tube containing helium shows a characteristic ivory-coloured and rather shining positive column. With a trace of air the column assumes a matt appearance of approximately the same colour, while the effect of water vapour is to change it to rose-pink.

Normally a leaky tube shows the matt colour, but occasionally under very humid conditions and with very fine leaks the colour changes to rose. I cannot affirm that this is due to water alone, and not to a mixture of air and water, but as a bigger 'leak' under the same atmospheric conditions gives the 'air' colour, it seems that at least a larger proportion of water gets in through the finer channels.

Incidentally, it has been our custom to fill up glass 'pinch' funnels with Faraday wax, to guard against fine 'wire leaks'; and of course, where possible, glass tubes being sealed off under vacuum should have the hot glass well twisted in order to squeeze up the fine air line which sometimes occurs in the 'pip'.

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ALTHOUGH Mr. Scarff's observations with a helium discharge tube do not provide any quantitative basis of comparison, they are at least in qualitative agreement with our results[1], inasmuch as "very fine leaks" apparently showed a rose-pink discharge characteristic of water-vapour, while larger leaks allowed air to enter the tube. On the basis of our results it is easy to show that air, as distinct from water-vapour, will begin to leak into an evacuated tube when the width of the channel through which the leak occurs is greater than about 2×10^{-4} cm., that is, when the pressure due to the surface tension of the water falls to about one atmosphere.

We conclude that the "very fine leaks" in Mr. Scarff's observations must be of the order of 2×10^{-4} cm. in width, when one would expect a mixture of air and water-vapour to leak into the tube. With wider channels the amount of air leaking into the tube would, of course, rapidly increase. This agrees with Mr. Scarff's remarks that "a larger proportion of water gets in through the finer channels".

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[1] Reekie, J., and Aird, J., *Nature*, **156**, 367 (1945).