"Get me the brush on the north side of the dresser," "Go and sit in the chair on the east side of the porch." She did not do this to train his sense of direction but merely because it was more convenient and less confusing for her. Out of this training the boy has apparently developed the unusual ability to move about a complicated path for relatively long periods of time and retain his orientation without paying attention to the process.

From a theoretical angle the fact that this boy has learned to orient himself for long periods of time over a devious path while occupying his mind with many other things furnishes a clue to help us to understand how certain birds and animals can wander for long distances and find their way home over unfamiliar territory. If this boy can orient himself to the compass directions without voluntary attention to the task for long periods of time, then it is not difficult to conceive why certain animals, to whom such an ability would have an important survival value in hunting or being hunted, can likewise maintain this sense of continuous automatic orientation, if not to points of the compass, at least to their homes.

It is obvious that other factors need to be discovered to explain the case of an animal being blindfolded, confused and carried for a considerable distance and then finding his way home, but then many animals can not carry out this stunt. Perhaps in the few cases reported where animals have been successful in this performance, certain cues that might have enabled them to retain this continuous automatic orientation were not eliminated.

HARRY R. DESILVA
PSYCHOLOGICAL LABORATORY,
UNIVERSITY OF KANSAS

MENDELIAN DIFFERENCES

MAY I be permitted to correct an error of attribution before it becomes more widely spread in the biological literature. Dr. E. S. Russell, in his recent very interesting book, "The Interpretation of Development and Heredity" (p. 64), quotes Johannsen[1] as responsible for the conception that Mendelian inheritance deals with *differences* rather than similarities. It is necessary to point out that this conception originated in a paper of mine[2] in 1915, where the matter is fully developed. It was also referred to again in my book "The Mutation Factor in Evolution" (1915, p. 313).

It is worth pointing out that in the same paper (p. 141) Johannsen uses the conception of a particular constitution as characteristic of every cell in each genotype. This conception is clearly stated in "The Mutation Factor" (p. 297) and, as is well known, was based originally upon the Oenothera mutations which have an extra chromosome in every nucleus. It was further considered in various aspects in "Mutations and Evolution."[3]

R. RUGGLES GATES
UNIVERSITY OF LONDON,
KING'S COLLEGE, STRAND

SCIENTIFIC APPARATUS AND LABORATORY METHODS

THE REMOVAL OF TRACES OF OXYGEN FROM NITROGEN

THREE general methods have been used to remove traces of oxygen from nitrogen: (1) To pass nitrogen through a solution which will remove the oxygen; some of the solutions used have been alkaline pyrogallol, ammonium cuprous chloride and alkaline hydrosulfite, with or without a catalyst as anthraquinone sulfonate suggested by Fieser.[1] (2) To remove oxygen with a solution such as ammonium cuprous chloride, which was placed in a large cylinder containing the gas under pressure; nitrogen, free from oxygen, but containing traces of ammonia, is delivered from the cylinder.[2] (3) To pass the nitrogen over a hot metal which will remove the oxygen and form the oxide of the metal; for this, copper has been shown to be much the most efficient, and has been used by the majority of investigators.

Variations in the potentials of solutions of cysteine which were observed in my laboratory when this type of purification was used indicated that under some conditions all traces of oxygen were not removed by the copper and suggested a reinvestigation of the problem concerned with the removal of oxygen from nitrogen.

Previous work had shown that a flow of between 200 and 500 cc of nitrogen a minute was desirable. For the removal of the traces of oxygen from this volume of nitrogen many different forms of tubes and furnaces were prepared and investigated. These need not be described in detail; the results eventually have led to a tube which has been thoroughly tested and has been proved to be satisfactory. It possesses several advantages when compared with the old type of copper furnace.

1 L. F. Fieser, *J. Am. Chem. Soc.*, 46, 2638 (1924).
2 H. Wartenberg, *Zeitschr. f. Elektrochemie*, p. 295 (1930).

1 "Some Remarks about Units in Heredity," *Hereditas*, 4: 133–141, 1923.
2 "Heredity and Mutation as Cell Phenomena," *Amer. J. Bot.*, 2: 519–528.
3 New Phytologist Reprint No. 12, pp. 118, 1921, now published by the Cambridge Press.