accurately as possible and correcting errors as soon as discovered. With this in mind, *Science* may care to trade Messrs. Koscher and Barter for Kascher and Baxter, who were the actual authors of the article which raised Dr. Smith's ire. This will prevent a fourth (and imaginary) set of discoverers of the vitamin-A acid earth-blue color creeping into the literature.

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[*Science* acknowledges the responsibility of introducing two fictitious investigators.]

Inactive (Non-oxygen-combining) Hemoglobin in the Blood of Ophidia and Dogs

The observations of E. Ammundsen (*Science*, 1939, 90, 372; *J. biol. Chem.*, 1941, 138, 563) revealed the presence of non-oxygen-combining (inactive) hemoglobin in 40 per cent of human bloods and in amounts varying from 2 to 12 per cent of total hemoglobin. Similar results were obtained by W. N. M. Ramsay (*Biochem. J.*, 1944, 38, 470) in 17 horses, with a frequency of 82 per cent and a mean value of 8.4 per cent for inactive hemoglobin (ferrihemoglobin). In agreement with Ammundsen, Ramsay identifies the inactive hemoglobin as methemoglobin—an assertion not shared by W. S. Cox and W. B. Wendel (*J. biol. Chem.*, 1942, 143, 331), who deny the presence of methemoglobin in the blood of various species, including man.

Since the subject is still a point of issue, it seemed worth while to extend these observations to other animal species, such as Ophidia and dogs.

In the experiments to be reported below, active Hb was determined by the oxygen capacity method of D. D. Van Slyke and W. C. Stadie (see Hawk and Bergeim's *Practical physiological chemistry.* (11th ed.) 1937); total Hb, by the iron method of E. Ponder (*J. biol. Chem.*, 1942, 144, 333). The observed difference between active and total Hb was attributed to inactive Hb.

The following table gives the values of inactive Hb found in four species:

Author	Species	Number of animals	Number of blood samples	Inactive hemoglobin: Frequency %	Inactive hemoglobin: Limits (g%)	Inactive hemoglobin: Average (g%)
Ammundsen (1941)	Man	53	82	40	2–12	...
Ramsay (1944)	Man	38	38	55	1.5–7	3.3
Ramsay (1944)	Horse	17	17	82	3.0–25.5	8.4
Prado (1944)	Jararaca	23	23	100	6.0–28	17.0
Prado (1945)	Dog	22	31	82	3.5–20.5	10.9

The table shows the impressing fact that in *Bothrops jararaca,* frequency (100 per cent) and mean quantity (17 per cent) of inactive hemoglobin are much greater than in the other species.

This is, to our knowledge, the first observation of inactive hemoglobin in the blood of poikilothermic animals and might be of some value in the study of the physiological significance of this unusual form of hemoglobin.

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Book Reviews

Animal breeding plans. (3rd ed.) Jay L. Lush. Ames, Ia.: Collegiate Press, 1945. Pp. viii + 443. (Illustrated.) $3.50.

This book continues to serve as a blueprint for improvement of animals through breeding. It is conveniently organized for a logical presentation of the subject, beginning with the background of animal breeding and the genetic principles which form a basis for scientific animal breeding. Breeding plans based on selection, relationship, and somatic likeness occupy a majority of the pages. Other pertinent topics concerning breeding plans and relating to reproduction are included.

Dr. Lush has been successful in presenting the genetic bases for animal improvement in a thorough and realistic manner. Necessarily complicated genetic explanations have not been avoided or oversimplified, but have been carefully clarified. Many of the principles developed by Wright, Fisher, and others are organized and discussed in order to make them more readily available to the student, research worker, and practical animal breeder. While this book serves as a text for undergraduate courses in animal breeding, it is well adapted to the use of graduate students and research workers. For the latter groups a more complete bibliography would increase its usefulness. The references are adequate for supplemental reading and, for some chapters, are arranged under subject headings so that the reader may readily choose those which fit his particular needs.

Commercial animal breeders who have an elementary understanding of genetics will find many aids to guide them in designing a breeding program which is most efficient for their conditions. They should welcome the realistic discussion of the rate of improvement which can be expected from various breeding plans and the clear statements of what each breeding method will and will not do in changing the genetic makeup of their herds.

Only minor changes have been made from the second edition. In general these involve the addition of recent references and are adequate in bringing the book up to date in most details. No mention is made of the

practice of selective registration by the Columbia Sheep Breeders Association since its organization in 1941, but this program may be too recent to permit critical evaluation. The chapter on sire indexes has been revised considerably. The book is well printed and bound. The subject index appears to be adequate.

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Correlation of cycles in weather, solar activity, geomagnetic values, and planetary configurations. (1st ed.) Maxwell O. Johnson. San Francisco: Phillips and Van Orden, 1946. Pp. viii + 149. (Illustrated.)

This book consists of numerous tables and graphs of rainfall, sunspots, planetary configurations, and other data, with comments on the results. The author is convinced that various cycles of considerable lengths in years, which are related to configurations of the planets, are demonstrated. He attributes the cycles in terrestrial phenomena to cycles in solar variation, and these solar cycles to electric or magnetic influences of the planets. His object in all this extensive computation and study is to find sufficiently reliable cycles in terrestrial phenomena to be of real value in forecasting yields of crops.

My own belief in the reality of certain periodicities in solar variation inclines me to hope that predictions of value may eventually be possible from studies of them. I regret that all of Mr. Johnson's data are yearly mean values. I think that it is desirable to have a more detailed basis, using monthly values, for the solar periodicities I accept are not multiples of years.

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Statistical methods: applied to experiments in agriculture and biology. George W. Snedecor. Ames, Ia. Iowa State College Press, 1946. Pp. xvi + 485. $4.50.

This is the fourth edition of this well-known work, which has been widely used in the fields of agriculture and biological research since its first appearance in 1937. The general order of presentation is the same as before: simple variation and correlation, some large sample theory and more complex cases of chi-square, analysis of variance and covariance, multiple and curvilinear regression, and more complex concepts. There has been considerable minor rearrangement, and new emphasis has been placed on sampling, fiducial limits, estimation, and components of variance. The format is somewhat more attractive than in previous editions.

The book begins with several new sections on sampling of attributes, considerably more imposing than the former very elementary opening. A table of fiducial limits for binomial material is introduced (its theory being left to Chap. 16). There is also a new and useful table of random numbers. Some of the ideas brought out in the former Chapter 1 are then developed. Other chapters show less difference from former editions, but in all there are changes. Graphic tests of significance