TEMPERATURE TOLERANCE OF MALE GERM-PLASM

As a physicist with only an elementary knowledge of biology, my remarks on R. B. Cowles's article on "Temperature Induced Sterility" in the March 2 issue of SCIENCE may be a bit naive. It seems to me, however, that the exposed location of the testes in an environment generally lower than body temperature is a natural cause of the lack of tolerance of male germ-plasm for high temperatures. It might be considered significant that the ovaries do not have an exposed location and do not have a low temperature tolerance. The causal chain would seem to be (1) exposed location of the testes to facilitate the reproductive act; (2) low temperature tolerance of male germ-plasm resulting from exposed location, rather than, as Cowles implies, (1) low temperature tolerance of male germ-plasm, and (2) location of plasm in a region kept below normal body heat.

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TRANSLITERATION OF RUSSIAN

I HAVE been reading with a great deal of interest the discussion on the transliteration of Kyrillic for English-speaking people. I think the growing importance of Russian technical literature makes finding a good solution to this problem imperative.

A satisfactory transliteration should fulfil the three following requirements: (1) When pronounced as an English word, reproduce fairly closely the sound of the Russian word; (2) should not require unusual (out-of-font) characters; (3) should allow unique reconstruction of the word in Kyrillic characters, so that it might be looked up in a Russian-English dictionary.

The *Chemical Abstracts* transliteration meets the first two requirements very well; I believe that the following simple modifications which are also in accord with the first two requirements given above, would enable it to meet the third requirement.

The modifications suggested are these:

(1) The soft sign should be represented by an apostrophe both in the middle and at the end of a word. If it is omitted at the end of a word, one will look for the word in the wrong place in the dictionary.

(2) The hard sign is not used much any more—never at the end of a word. To distinguish it from the soft sign, it could be represented by two apostrophes (''). Thus the verb "to explain" would be written ob''yasnyat'.

(3) E should be translated "ye." The character ë should be added to the list of Kyrillic characters, to be transliterated "yo." (All accented "e's" should not be transliterated "yo"—as this would cause too much confusion in reconstructing the Kyrillic word. Only e's specifically marked ë in the Russian text should be so treated.)

(4) In order to render the reconstruction of the Kyrillic word unique, the transliteration of bI as "y" could not be retained. Perhaps ü would be as good as any—and certainly as much in accord with requirement (1) as "y" is at present.

It is freely admitted that defects remain in this system, such as that of treating the genitive singular ending of adjectives and pronouns. However, I believe that the system I propose would enable any one moderately familiar with Russian to construct correctly the original Kyrillic work from its transliterated equivalent, thus meeting requirement (3). Of course, this entire argument applies only to the new orthography, for which I believe the modified transliteration permits close observance of my third requirement, without disturbing significantly the advantages of the *Chemical Abstracts* system in regard to the first two requirements.[1]

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SCIENTIFIC BOOKS

AGRICULTURAL CHEMISTRY

A Source Book of Agricultural Chemistry. By CHARLES A. BROWNE. x + 290 pp. 32 figures. Waltham, Mass.: Chronica Botanica Company. 1944. $5.00.

DR. BROWNE'S "Source Book of Agricultural Chemistry" has a far broader appeal than is implied in its title; it is a thoroughly scholarly document in the history of chemistry. Agricultural chemistry is understood by the author to mean the applied science that deals with "the chemical composition and mutual chemical relations of soils, fertilizers, crops, and farm animals in so far as they concern the production upon the farm of agricultural supplies." Accordingly, not only is the fundamental chemistry of the elements and their compounds involved but also many aspects of biochemistry, physiology, botany, geology, and even meteorology and engineering. Thus the book includes discussions among many others of such men as Paracelsus, Bacon, Boyle, Stahl, Priestley, Cavendish, Scheele, Lavoisier, Davy, Mulder and Liebig, whose work laid the early experimental and theoretical foundation of pure chemistry and who must be considered in any historical introduction to this science, together with Grew, Hales, Ingen-Housz, de Saussure,

[1] The transliteration of all characters not mentioned above would remain as now indicated in *Chemical Abstracts.*

de Candolle and Boussingault, who were the most important of the early workers in the physiology of plants, and, in addition, Tull, Duhamel, Home, Thaer, Chaptal, Schübler and Sprengel, who were the leaders in the application to the problems of agriculture of the observations and speculations of these other investigators.

The book contains seven chapters in which the men chiefly responsible for the progress of agricultural chemistry are treated in historical order beginning with an entertaining and highly informative account of the theoretical views and accomplishments of the Greeks and Romans. This is followed by a discussion of representatives of the sixteenth and seventeenth century alchemical and iatrochemical schools of thought, and by successive chapters on the workers of the period of the early Royal Society, of the early and the late phlogiston period, of the period of the chemical revolution that began with Lavoisier, and by a final one upon more recent investigators up to the time of Liebig. It is within this framework that the author describes the conditions which led to the application to agricultural science of modern scientific views, a result for which Liebig was in many ways primarily responsible through the publication in 1840 of his celebrated book, "Organic Chemistry and Its Applications to Agriculture and Physiology."

Nothing so comprehensive and at the same time so detailed has, to the knowledge of the reviewer, been attempted and so satisfactorily accomplished. Although the book is far indeed from being light reading, it is invariably interesting and stimulating; the product of a ripe scholarship and of an amazing breadth of knowledge and experience, it fills a place in the history of chemical science that has hitherto been only superficially if at all dealt with. It will doubtless become required reading in all courses that attempt to describe this field.

The text contains biographical sketches which are illustrated by comprehensive quotations from the writings of the investigators discussed, and illuminated by clear descriptions of the fundamental experiments upon which their most important contributions were based. The numerous figures include reproductions of the title pages of many of the classical publications in chemistry and in agriculture, as well as illustrations of apparatus or experiments taken from the originals. Each of the sections contains a selection of references to the titles of the more important books and papers of the subject as well as to other biographical and historical material concerning him or his work. The book ends with an appendix which gives an outline of sources in the history of agricultural chemistry from the time of Liebig to the present. For this period there is a wealth of material available in any library; what Dr. Browne has accomplished is to make the earlier and rarer material available in brief and attractive form by publishing what is in effect an abstract of a lifetime of reading and research into the background of his field of special interest.

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THE IMPROVEMENT OF LIVESTOCK

Livestock Improvement. By J. E. NICHOLS. 208 pp. Illustrated. Edinburgh: Oliver and Boyd, Ltd. 1944. Price 10/6.

THE excellent little volume is a valuable addition to the literature on animal breeding. The author has brought together a wealth of material, drawn from a broad experience and extensive travel. The presentation of the genetic background for problems of animal breeding is sound and clear. The author may have gone a little too far in his emphasis of the influence of the environment, but this emphasis does have the merit of counteracting the tendency of some texts on breeding to ignore entirely this factor. Much consideration was properly given to the problem of acquiring adequate standards for measuring genotypic differences among animals. This text is not designed for the novice, since there has been no avoidance of technical terms or some of the involved phases of selection. Certain topics such as crossbreeding have been dealt with somewhat arbitrarily, but this may be expected in a text so limited in scope.

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REPORTS

CONFERENCE ON SCIENCE EDUCATION FOR NATIONAL SECURITY

A CONFERENCE on "Science Education for National Security," held at the Engineers Club in Philadelphia on Friday, March 30, 1945, was attended by 50 representatives of science, industry and labor.

The leading speaker at the meeting was Dr. Marion H. Trytten, director of scientific personnel of the National Research Council, who reported on pending and proposed legislation designed to alleviate the alarming scarcity of highly trained scientific workers and on other steps being taken to improve the situation. Dr. Trytten predicted that the termination of hostilities would bring little relief because demand