LETTERS

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Symbols to Indicate Castration

Symbols and abbreviations are used by most scientists and researchers when recording or describing the result of some observation or experiment.

Symbols denoting the sexes of animals (♂ ♀) have been used for many many years. There is nothing about these symbols, however, to indicate whether the animal is sexually intact and in possession of its gonads or whether it is a castrate. The importance of indicating the difference may be very great at times.

It is proposed that the circle part of the symbol be opened in the case of castrates to form the letter C. The arrow and cross-piece characteristic of the male and female, respectively, would have their regular position on the circle.

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"Weaver Finch"

Mayr, Linsley, and Usinger [*Methods and Principles of Systematic Zoology* (1953), p. 17] state: "Even the experimental biologist has learned to appreciate the necessity for sound, solid identification. There are great numbers of genera with two, three, or more very similar species. Such species very often differ more conspicuously in their physiological traits than in their morphological characters."

This statement seems so obvious to most taxonomists as to make its repetition verge on the flogging of a dead horse. Hence it was all the more surprising and disappointing to find the paper by S. J. Segal in the December 13 issue of *Science* [*Science* **126**, 1242 (1957)] describing certain hormonal experiments on "the weaver finch." Taxonomists have more or less resigned themselves to seeing generalizations in the literature of such disciplines as physiology, endocrinology, and embryology about *the* duck, *the* goose, *the* pigeon, *the* rat, or *the* rabbit; it can be reasonably assumed that the experimental animal in such cases is the common domesticated species (although I believe it should be explicitly so stated). However, "*the* weaver finch" is completely meaningless. "Weaver finch" is a general

term applied to many of the members of a very large bird family, Ploceidae, which may even be of polyphyletic origin. No more precise name than "weaver finch" is given, either in English or in Latin, in Segal's paper. It might be argued that reference can be made to earlier papers cited; this is true, although it should not be necessary. Checking one of Segal's cited references, that to Witschi's paper in *The Wilson Bulletin,* I find no less than four species of the family Ploceidae mentioned: the English sparrow (*Passer domesticus*), the paradise whydah (*Steganura paradisaea*), the red-billed weaver (*Quelea quelea*), and the orange weaver (*Euplectes orix*). Scientific names are given by Witschi for the last two only. The brief description given by Segal of his experimental birds ("the male bird assumes a bright yellow and black plumage . . .") fits none of the species mentioned by Witschi; the *Euplectes,* which comes closest, is described by Witschi as "black and orange red."

Segal's experimental bird is not identifiable from his description as published. In any case, it is almost certainly a member of a genus of the sort mentioned in the quotation from Mayr, Linsley, and Usinger, "with two, three, or more very similar species"—there are many such genera in the Ploceidae. The normal cycle of molts and plumages in wild birds may vary, even among closely related species, to the extent that it should be considered of fundamental importance to establish the identity of the experimental birds.

One further point. Segal mentions his "weaver finch" as being "readily available in the United States because large numbers are imported for sale to bird fanciers." Having had experience in recent years for the identification for zoos and aviaries of birds sold by importers, I would consider such birds to be extremely unreliable as standardized experimental animals. Birds of several genera are sold under the general term "weaver birds." A dealer may supply two shipments of what he honestly believes to be the same species to the experimenter; unfortunately, neither may be capable of recognizing the differences between closely-related species in a genus such as *Ploceus,* one of the largest genera of weavers; the consecutive shipments may well involve more than one species. Even *within* a single species the possibility arises of geographic variation in physiological characteristics, a well-known phenomenon in certain groups of birds and other animals. Very few importers of cage birds have any notion as to the precise area of Africa from which their weaver birds may be derived.

In the absence of an established breeding stock of experimental animals such as is now available for the golden hamster or the budgerigar, it would appear to be of critical importance for nontaxonomic zoologists to secure authoritative taxonomic identifications of their subjects before publication of their results.

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I shall humbly agree that, in my description of "the weaver finch," it might have been pointed out more clearly that the so-called "yellow weaver" or "Napoleon weaver" (*Euplectes afra*) is the species that serves in the establishment of the standard of the discussed hormonal reaction.

In all other respects the criticisms of Parkes seem misdirected. Before writing a letter to the editor, he might have consulted not only the oldest but also the most recent summary by Witschi (reference *3* of my report). He would have found color photographs, of various species and reactions, adequate to satisfy anyone more particularly interested in the taxonomic and technical aspects of the feather reaction. He might then, also, have followed a reference to a readily available paper [E. Witschi, *Endocrinology* **27**, 437 (1940)] in which *weaver finch test* and *weaver finch unit* are introduced as technical terms. In accordance with good usage, these terms are clearly defined, and the reactions of *E. afra* are compared with those of several other species.

It should be evident to all readers that my short report in *Science* of 13 Dec. 1957 was meant to be a contribution to endocrine physiology. Taxonomic considerations do not necessarily enter into the discussion of assay materials such as I have presented. All data refer to a single species. Moreover, each individual bird serves as its own control. The positive or negative reaction of a bar across a single regenerated feather is always compared with the tip and the base which grew before and after injected hormone substances were present in the systemic circulation. With this I do not deny that taxonomic and physiologic variation in plumage characters of finches is a subject of interest. Publication of a large assemblage of data that I have collected in Iowa City over more than twenty-five years is, in fact, in preparation.

Regarding the quotation from Mayr, Linsley, and Usinger, there can be little doubt but that these three experts mean exactly what they say: namely, that the experimental biologists *have* learned to appreciate physiologic traits and differences. If "most taxonomists" are wise to it as well, for whom, Dr. Parkes, was their message intended?

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EQUIPMENT NEWS

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■ SUPERCONDUCTIVE MEMORY element, the Persistor, is designed for switching times as short as 10 mμsec. The device operates within a few degrees of absolute zero. The Persistor is a loop composed of segments of two metals, both maintained in a superconductive state. The passage of a critical current through one of the segments causes that segment to revert to its resistive state. The direction of subcritical current in the loop carries the information being stored and is determined by impressing an interrogating current pulse. (Ramo-Wooldrige Corp., Dept. S873)

■ IRRADIATION CHAMBER can safely contain up to 25,000 of Co^{60} and can receive for irradiation a sample up to 10-in. in diameter by 10-in. long. The sample to be treated is placed on a tray in front of a large, electrically driven lead-filled block. Motion of the sample into the chamber is controlled by pushbutton. Locking of the chamber, moving of the source into position, irradiation of the sample, and removal of the sample are automatically controlled according to a preset cycle ranging from 1 min to 120 hr. Electrical and mechanical interlocks insure safety. (Budd Co., Dept. S874)

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■ FURNACE operates at 3300°F and at pressure of 3000 lb/in². The furnace charge can be observed or moved at full temperature and pressure. Temperature is held constant to ± 1°F. Static and dynamic pressure seals are made with "O" rings. (Vacuum Specialties Co., Inc., Dept. S889)

■ AUTOMATIC VOLTAGE REGULATOR is designed to extend the life and reliability of electron tubes. When equipment is energized, voltage to the tubes is increased gradually to minimize surge strain on the filaments. A control circuit is automatically actuated at the proper