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Wilmer J. Miller
Iowa State University

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Pedigree Style in Teaching Genetics¹

WILMER J. MILLER

Department of Genetics, Iowa State University, Ames, IA 50011

A single pedigree style, the arrow or network method, is presented that is generally superior to, or as useful as, the other commonly used methods in teaching genetics. It is adaptable to all uses of pedigrees and necessary in some. Clarity of inbred relationships, generation overlap, and lack of the need for right angle turns are the major advantages.

INDEX DESCRIPTORS: Pedigree style, teaching genetics.

Several types of pedigrees are used in animal and plant breeding, genetics problems, and genealogy. The well known line bifurcation style (Fig. 1) of animal science is not adaptable to many genetic problems. Further, it is inefficient in that inbred lines may have the same individual's name written down several places. In Fig. 1 "Favorite" is written 5 times in the ancestry of Lancaster, although this is not immediately obvious, nor is the fact that "Favorite" was mated back to his own mother to produce "Y. Phoenix." Presentation of this same data in the network or arrow style (Fig. 2) makes the multiple use of "Favorite" obvious even though his name is written only once. Further, the sex is readily distinguished by using dashed lines for the female contribution or line of descent. Alternatively, the sex symbols ♂ and ♀ may be used.

Such a network pedigree not only clarifies the breeding system but corrects the first impression one gets regarding the number of grandparents and the number of generations. In Fig. 3a there seem to be 3 ancestral generations, and there seem to be 7 great grandparents instead of the expected 8 (1 repeated). But "SPEEDY" actually has 5 ancestral generations indicated, and only 2 great grandparents (Fig. 3b).

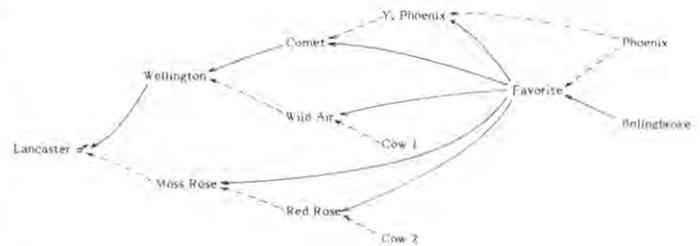


Fig. 2. Network or arrow style. Partial pedigree of the origin of the Shorthorn breed of cattle (after Wriedt 1930).

The traditional square and circle of human pedigrees have only limited uses genetically and are awkward in handling more than 2 marriages (not illustrated). The classical genetic style (Fig. 4) employs the P₁, F₁, and F₂ symbols in Mendelian problems. Since it is used vertically, the most interesting results appear at the bottom of



Fig. 1. Bifurcation Style. Partial pedigree of the origin of the shorthorn breed of cattle (after Wriedt 1930).

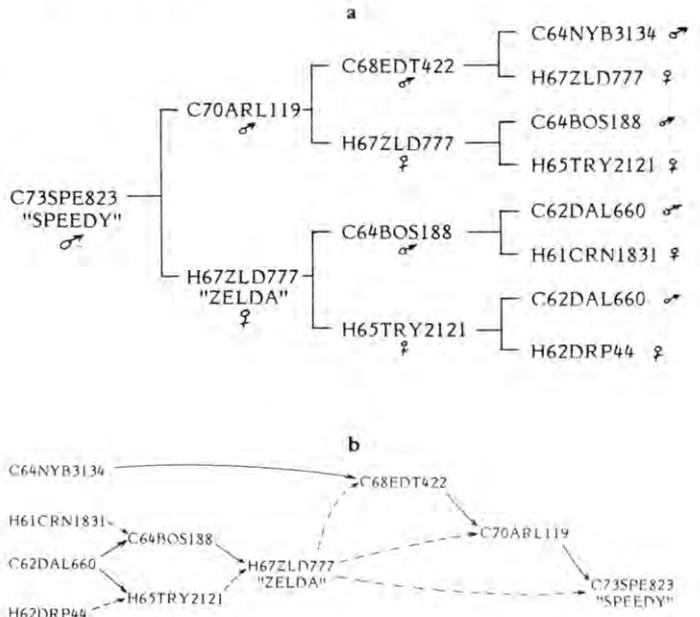


Fig. 3. A racing pigeon pedigree: a) conventional, b) arrow pedigree, no repetitions.

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