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## The “Konrad Lorenz Duck Film Collection”: a monument to methodology and history of science re-discovered

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**Abstract** Two hundred reels of 16-mm film, containing records of a variety of behavior patterns, mostly of dabbling ducks and geese, were discovered in the spring of 2010 in the attic of the Lorenz mansion in Altenberg—original footage, most of them taken by Konrad Lorenz himself, between 1950 and 1958 at his research station in Buldern (Westphalia, Germany) and at the Severn Wildfowl Trust in Slimbridge [Great Britain (now The Wildfowl and Wetlands Trust)]. These films are now available for further analysis at the Konrad Lorenz Institute for Evolution and Cognition Research, Altenberg Austria.

**Keywords** Dabbling ducks · Courtship behaviour · Film record · Konrad Lorenz

**Zusammenfassung** Im Frühjahr 2010 wurden am Dachboden des Lorenz-Hauses in Altenberg die verschollene Sammlung von Schwimmfilmen gefunden, 200 Filmrollen 16 mm vorwiegend Originalaufnahmen von Konrad Lorenz, zwischen 1950 und 1958 in Buldern (Westfalen; Forschungsstelle für Verhaltensphysiologie der Max-Planck-Gesellschaft) und in Slimbridge (Severn

Wildfowl Trust; nun Wildfowl and Wetlands Trust) aufgenommen. Diese Filme sind nun im Konrad-Lorenz-Institut für Evolutions- und Kognitionsforschung für weitere Analysen verfügbar.

Konrad Lorenz was a pioneer of photography and motion picture filming in behavioural studies. As soon as Lorenz had found a firm foothold for his research within the Max-Planck-Gesellschaft at his tiny institute in Buldern (Westphalia) in 1950, he started a duck research project focusing on the courtship behaviour patterns of dabbling ducks. He patiently filmed duck courtship to add to his growing archives of 16-mm movie footage. About the same time, a new centre for scientific motion picture production and archiving was established in Göttingen, Germany, as the “Abteilung Hochschule und Forschung” of the “Institut für Film und Bild in Wissenschaft und Unterricht”, later known as the “Institut für den Wissenschaftlichen Film” (IWF). IWF generously supported the pioneering work of Lorenz, who, in turn, became an influential proponent of their activities, e.g. founding member of “Encyclopaedia Cinematographica”, an international organization for the publication of scientific film that can be considered as a scientific forerunner of today’s YouTube.

As a first instalment of his dabbling duck studies, Lorenz published a research film on courtship and pair formation in Mallard *Anas platyrhynchos*, with a detailed description of the particular behaviour patterns (Lorenz 1952a, b, 1982).

Lorenz was a keen observer and excellent draftsman, and supplemented his descriptions with detailed photographic records, tracings, and motion pictures.

For Lorenz, the documentation of behaviour in a motion picture was an important tool, in the sense of complementing

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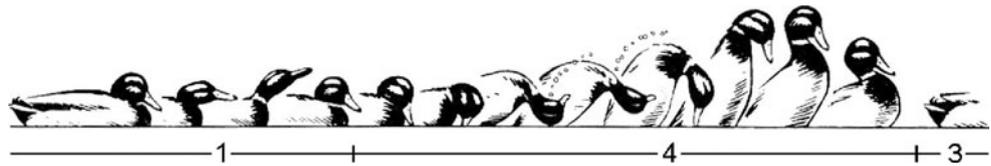
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**Fig. 1** Single frame tracings of a Mallard *Anas platyrhynchos* drake's grunt-whistle (4), preceded by a head-flick (1) and followed by a tail-shake (3). Drawings: Herman Kacher 1957



the classical methods of “inductive natural science”, based on a detailed qualitative and quantitative description and subsequent development of specific working hypotheses, as indispensable preconditions for experimentation.

What is so special in this inductive method that Lorenz had put into practice in his ethological investigation of animal behaviour by using motion pictures? The answer: a stepwise analysis of his observation records, proceeding along a sequence of their most appropriate representations. He exemplified this stepwise procedure in his study of duck courtship, where the end product is an edited movie, e.g. “Courtship and pair formation of the Mallard” (Lorenz 1952a, b), and in his discussion of the evolution of behaviour (Lorenz 1958; see also Fig. 1). His pioneering effort laid the foundations for innovative analyses of behaviour patterns (e.g. Finley et al. 1983).

Today, photo, strobe, cinematography, video and digital image processing provide tools that increase the possibilities and fidelity of pictorial representation of complex dynamic processes. Nevertheless, the stepwise alternation between live observation and its record continue to be indispensable in the analysis of behaviour. An instructive example for this iterative process of refinement is the grunt-whistle. In this case, the process was started by Oskar Heinroth (1911), and the most recent update we were able to find was published in 2000.

### Technical details

These movies were recorded with a 16-mm spring-wound Bolex, originally on black and white 16-mm movie film. The exposed film was sent to the “Abteilung Hochschule und Forschung” in Göttingen for developing and safe-keeping and in return Lorenz received, as a rule, two working copies. A first editing was done with a hand-cranked Moviscop viewer on his desk, where he kept two “master”-reels, one labelled “Entenbewegungsfilm” (duck courtship reel) and the other “Entenarten” (duck species reel). Both contained the identical footage but were spliced in a different sequence. Whereas on the duck courtship reel, all cases of a particular type of behaviour, e.g. initial

bill-shake of Mallard, Garganey *Anas querquedula*, Pintail *Anas acuta*, etc., were followed by all the grunt-whistles of Mallard, Garganey, Pintail, etc., on the duck species reel, all behaviours of a particular species were edited in sequence, starting with the Mallard's initial bill-shake, grunt-whistle, head-up-tail-up, etc., followed by these behaviours of the Garganey, and so on. Lorenz worked on these reels for many years and brought one or both along to many of his lectures for specific demonstrations. Because of the many splices with a tendency to break at the most undesired moment, occasionally a copy of one of these reels was made, and special collections were arranged for better viewing and analysis.

Unfortunately, the written documentation concerning the material is very sparse. There is a list of the reels, prepared when the material was transferred from the Grünau research station to the Altenberg Institut in 1992, and in some of the film cans are lists of species or cuts. The extensive records kept by Herman Kacher have been lost, or not yet located. An initial task to be performed will be a detailed review of the material and a listing of which species and behaviours are on record. For updates, please check <http://kli.ac.at/KLArchive/duckfilms.html>.

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