Leaving through some past issues of *TICS* (an activity that is always pleasurable and informative), I noticed a depiction of the famous "duck-rabbit" figure, described as an "illusion" and attributed to Wittgenstein (Malach, Levy, & Hasson, 2002).

Technically, the duck-rabbit figure is an ambiguous (or reversible, or bistable) figure, not an illusion (Peterson, Kihlstrom, Rose, & Glisky, 1992). The two classes of perceptual phenomena have quite different theoretical implications. From a constructivist point of view, many illusions illustrate the role of unconscious inferences in perception, while the ambiguous figures illustrate the role of expectations, world-knowledge, and the direction of attention (Long & Toppino, 2004). For example, children tested on Easter Sunday are more likely to see the figure as a rabbit; if tested on a Sunday in October, they tend to see it as a duck or similar bird (Brugger & Brugger, 1993).

But the more important point of this letter concerns attribution: the duck-rabbit was "originally noted" not by Wittgenstein, but rather by the American psychologist Joseph Jastrow in 1899 (Jastrow, 1899, 1900; see also Brugger, 1999), when the famous philosopher (b. 1889) was probably still in short pants. Along with such figures as the Necker cube and the Schroeder staircase, Jastrow used the duck-rabbit to make the point that perception is not just a product of the stimulus, but also of mental activity -- that we see with the mind as well as the eye.

Although many versions of the duck-rabbit figure have been used in research, the version published in *TICS* is Jastrow's own (Jastrow, 1899, p. 312).

Jastrow's cartoon was based on one originally published in *Harper's Weekly* (November 19, 1892, p. 1114). The *Harper's* cartoon, in turn, was based on one that had appeared earlier that year in *Fliegende Blatter*, a German humor magazine published in Munich (October 23, 1892, p. 147).

As an aside, there are interesting differences among the figures. Jastrow's version is oriented horizontally, with the duck's bill level with the rabbit's head; the figure in *Harper's* has the bill tilted slightly upward, and the original in *Fliegende Blatter* even more so, making the reversal more dramatic (at least to my eyes). Wittgenstein's version is more schematic, an outline with no textured infill. Brugger (1999) has provided a comprehensive catalog of duck-rabbit
variants, along with normative data on their ease of reversibility.

The confusion in attribution may derive from Gombrich (1960, p. 5), whom many psychologists have read, who in turn cited Wittgenstein (1953/1958, II.xi, pp. 165-166), whom many psychologists (including myself) have not. Gombrich also cited Fliegende Blatter, as well as Scheidemann (1939, p. 67), but he did not cite Jastrow. Wittgenstein himself, however, clearly attributes the figure to Jastrow (1900).

Jorgen Dyrstad, a graduate student in philosophy at King's College, London, discusses the duck-rabbit as an example of seeing-as in a forthcoming article in the Proceedings of the 40th International Wittgenstein Symposium. He also discusses Wittgenstein’s use of the duck-rabbit in his paper on "Wittgensteinian Naivety".

I make these points not out of sheer pedantry (though I am certainly capable of it), but because Jastrow (1864-1944) is an important if neglected figure in the history of psychology (Blumenthal, 1991; Jastrow, 1930a). Among his many credits:

- Jastrow received the first PhD in psychology awarded by an American university, from Johns Hopkins in 1886.
- G. Stanley Hall’s degree, from Harvard in 1876, is commonly considered to be the first in psychology, but technically it was in philosophy and psychology.
- James McKeen Cattell, the first American to study psychology under Wundt, took his degree from Leipzig in 1888.
- Peirce and Jastrow’s pioneering study of "subliminal" perception was the first psychological investigation undertaken at Johns Hopkins University, from December 1883 to March 1884 (Peirce & Jastrow, 1884).
- This may not have been the first formal psychological experiment performed in America. James did experiments with his students at Harvard as early as 1875, but so far as I can determine none of these was published. (James himself disliked experimentation, except on hypnosis, but understood that experimental methods had to be taught to students.)
- But it was the first to be performed in an American laboratory expressly designated for psychological research.
- So far as I can determine, it was the first psychological experiment to be published in an American scientific journal.
- Cattell published in Brain (1885) and Mind (1886 and 1887), but these are European journals, not American; and, strictly speaking, they’re not psychology journals. The American Journal of Psychology, the first journal anywhere to carry “psychology” in its title, began publication in 1887. In any event, Peirce & Jastrow published earlier.
- Jastrow was the founding professor of psychology at the University of Wisconsin, in 1888.
- Jastrow’s most famous graduate student was Clark L. Hull, whom he introduced to hypnosis research (Kihlstrom, 2004), and whose dissertation was a pioneering study of concept formation.
- Hull’s need for specialized laboratory equipment led Stoelting & Co., of Chicago, to become the first manufacturer of psychological apparatus for commercial sale (Popplestone, 1994). So, in a sense, Jastrow was indirectly responsible for the establishment of a major academic support industry.

- Jastrow retired from Wisconsin in 1927, the longest unbroken tenure in psychology in a single institution to that date.
- After the American Journal of Psychology was founded, Jastrow devised the set of conventions for reporting psychological research which evolved into "APA style" (Jastrow, 1890).
- Jastrow and William James, with whom he shared an interest in unconscious processes (Jastrow, 1906), were the only Americans to attend the First International Congress of Psychology (Paris, 1889). In his Principles of Psychology (1890), James cited Jastrow more than any other American except James McKeen Cattell; James and Jastrow were also treated by the same physician for depression.
- Following the example of Sir Francis Galton in England, Jastrow developed the psychology pavilion at the Columbian Exhibition in Chicago (1893), the first attempt to popularize the new science, as well as the concept of mental testing, in America.
- To this end, Jastrow also published Fact and Fable in Psychology, the first popular book on the subject, and the book cited by Wittgenstein as the source of the duck-rabbit figure (Jastrow, 1900).
- A vigorous proponent of faculty control over university affairs, and of academic freedom (Jastrow, 1912), in 1915 Jastrow was one of the founders of the American Association of University Professors.
After retirement from Wisconsin, Jastrow continued to teach at the New School for Social Research. His popular lectures, syndicated newspaper articles, and NBC radio programs on “Keeping Mentally Fit” were important contributions to the mental hygiene movement of the early 20th century (Jastrow, 1930b, 1930c). In a very real sense, Jastrow was psychology’s first media star.

Ardently opposed to the doctrinaire positions of both Watsonian behaviorism and Freudian psychoanalysis (Jastrow, 1929, 1935), Jastrow argued against a “too early and too close specialization” in psychology, and for a “historical sense of... antecedents” (Jastrow, 1930a, p. 161) -- prescriptions that are still valid in psychology and cognitive science today.

We may not be able to do anything about increasing specialization, which seems to be the way of all scientific development. But against any trend toward disciplinary amnesia, we should remember Jastrow at the very least for introducing psychologists, more than a century ago, to a phenomenon that is probably familiar to every student who has ever taken the introductory course -- including, perhaps, Wittgenstein himself.

**Note added October 2005:** Most versions of the duck-rabbit show only the head and neck, as in Jastrow's "original" and Wittgenstein's more schematic version. However, in 1930 Walter Ehrenstein (1899-1961), a German psychologist, introduced a full-body version of the duck-rabbit -- crediting Jastrow (1900) as the source for his inspiration (Ehrenstein, 1930; see also Ehrenstein, 1954). Although this note was originally concerned only with the issue of Jastrow versus Wittgenstein, Ehrenstein's version is a thing of such beauty that it deserves to be more widely known.

Brugger (1999) does not cite Ehrenstein *per se* in his list of variants on the duck-rabbit, but he does show a cropped, reflected version of the Ehrenstein figure (Brugger's Variant 4), used by Ricci and Blundo (1990). These investigators, in turn, cited Attneave (1971) as the source for the duck-rabbit, as well as the other reversible figures used in their experiment. However, in his article Attneave actually presented, and cited, the original Jastrow version of the duck-rabbit.

In Brugger's (1999) study, the Ehrenstein version performed about as well as Jastrow's original (Note that Brugger prints the Ehrenstein version with the duck facing to the right: Ricci & Blundo follow Ehrenstein's original, with the duck facing left.)

I thank Ehrenstein's son, Walter H. Ehrenstein, of the Leibniz Research Center for Human Factors, University of Dortmund, for drawing my attention to this version of the duck-rabbit (personal communication, 10/16/05).

**Note added June 2006:** The duck-rabbit was also attributed to Wittgenstein by Anne Barton in a review of a book on Shakespeare in the *New York Review of Books*("The One and Only", 05/11/06. However, the illustration accompanying the article is Jastrow's version, not Wittgenstein's, and is attributed to *Fliegende Blatter*.

**Note added December 2009:** The duck-rabbit figured in the cartoon, drawn by Paul Noth, drawn for the "Cartoon Caption Contest" offered by the *New Yorker* in its issue of December 14, 2009. Actually, it's not clear whether Cullum intended to refer to Jastrow's figure. But the issue of January 4, 2010 announced the three finalists in the contest, one of which -- entered by Anne Murphy of Ann Arbor, Michigan -- clearly did. Unfortunately, Murphy's caption didn't win -- the injunction to avoid direct sunlight did (*New Yorker*, 01/18/2010). Too bad.


**Note added November 2010:** Sai Emrys, a former UC Berkeley student, found this alternate representation of the duck-rabbit on the *Squiddoo* website -- which also contains Jastrow's original duck-rabbit figure. (So far as I can determine, the post was anonymous, but if the artist contacts me, I'll be happy to amplify the credit line).
Note added May 2011: David Kellner, of Austria, contributed this drawing, inspired by the duck-rabbit.

Mr. Kellner also pointed me to the logo for "Duck Rabbit Studios".

And to this sculpture, artist unknown, on the “Blame It On the Voices” blogsite (added August 1, 2011).

Note added January 2012: Roger N. Shepard's wonderful book of visual illusions, ambiguities, and other anomalies of visual perception includes a "real life" version of the duck-rabbit (pp. 39-40). As Shepard tells the story, when he was in high school (presumably in Palo Alto, where he was born), his friend Ken Harmon saw a rabbit grazing on the lawn, and commented, "Look, there's a duck on its back!". It was only much later that Shepard learned about Jastrow's paper. This drawing, taken from Shepard's book, portrays the scene as Shepard remembered it.

Note added November 19, 2013: Prof. Peter Milne of Stirling University has informed me that a modification of Jastrow's version of the duck-rabbit figure is the logo for the Duck-Rabbit Craft Brewery in Farmville, North Carolina. Link to the Duck-Rabbit Craft Brewery website and an explanation of the logo.

Note added June 9, 2016: A clever version of the duck-rabbit was published on a blogpost by "dopp3lganger". I thank Dr. Saul Albert of Queen Mary University, London, Tufts University, and the Berklee College of Music, for pointing this one out to me.

Note added June 30, 2017: Another fabulous New Yorker cartoon, by Paul Noth, also featuring Boring's "wife/mother-in-law" figure, appeared in the July 3, 2017 issue (thanks to Richard Moe for correcting an erroneous date given on a previous version of this page).

Noth must have really enjoyed his introductory psychology course. In addition to this second use of the duck-rabbit (see Note from December 2009, above), he also did a cartoon based on Boring's figure alone (right), as well as one based on Walter Mischel's famous "Marshmallow Experiment" (left).

Note added July 17, 2017: Here's an interesting "live real-life" view of the duck-rabbit, posted by "wyattoil" to the imgur image-posting website. The "duck" seems to be some sort of heron. Thanks to Jonathan Ellis, a philosopher at UC Santa Cruz, for pointing this one out. Note added July 23, 2018: Everett Criss, an engineering student at UC San Diego, has suggested that it might be a kookaburra.
Note added September 2, 2017: Here's another "real-life" duck-rabbit (this time a duck), found on NEJM Journal Watch, on a blog concerning HIV treatments written by Paul E. Sax, a professor at Harvard Medical School (he also included the duck-rabbit "graph" illustrated above -- both apropos of nothing in the blog that I can tell. I thank Jorgen Dyrstad for sharing this image with me.

Note added October 18, 2017: Here's another one by Paul Noth, who does seem to have a special relationship with the duck-rabbit. I don't know where or when this one was published. Noth's cartoons frequently appear in the New Yorker, to which I've been a long-time subscriber, but somehow I missed this one. It was sent to me by a correspondent, whose message unaccountably disappeared from my inbox before I could write down his name. If he contacts me, I'll fix the attribution.

The Duck-Rabbit in Art

A number of artists have made use of the duck-rabbit, and similar reversible figures, in their paintings. Among these are David Garneau, who teaches at the University of Regina in Saskatchewan, Canada.

References


Duck! Rabbit! can be a great way to introduce children to the idea that things are not always as they seem. Based on a drawing made in 1899 by American psychologist Joseph Jastrow, Duck! Rabbit! is told through a conversation between two people who come upon a creature. One of the people is convinced they are seeing a duck; the other a rabbit. Is it a duck getting a drink of water? Or a rabbit cooling his ears? Maybe the duck wading in the swamp - or is that a rabbit hopping through the grass? The language is very simple, which makes it ideal both for reading to a small child or for an early reader to read to you. My niece was able to read it prior to starting the first grade, for example.