

Leśniewski's Wheel and Spoke Notation

V. Frederick Rickey fred.rickey@me.com

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Leśniewski described his wheel and spoke notation in 1939 [English translation in *Stanisław Leśniewski. Collected Works*, pp. 669–671]. He devised it in order to precisely formulated the deductive rules of Protothetic and Ontology, but did not use it in class or other informal situations.

I have created his symbols for equivalence ($\overset{\circ}{\dashv}$), and ($\overset{\circ}{\dashv}$) and if-then ($\overset{\circ}{\dashv}$). By examining the macros in the file `WheelAndSpokeNotation.tex` you should be able to create other symbols that you need. I have also used Leśniewski's symbol for negation (\vdash).

Here is the original axiom of Leśniewski's Ontology using this symbolism:

$$\begin{aligned} \lrcorner Aa \lrcorner \overset{\circ}{\dashv} (\varepsilon \{Aa\}) \overset{\circ}{\dashv} (\vdash (\lrcorner B \lrcorner \vdash (\varepsilon \{BA\}) \neg)) \\ \lrcorner BC \lrcorner \overset{\circ}{\dashv} \overset{\circ}{\dashv} (\overset{\circ}{\dashv} (\varepsilon \{BA\}) \varepsilon \{CA\}) \varepsilon \{BC\}) \neg \\ \lrcorner B \lrcorner \overset{\circ}{\dashv} (\overset{\circ}{\dashv} (\varepsilon \{BA\}) \varepsilon \{Ba\}) \neg) \neg \end{aligned}$$

The L^AT_EXcode for preparing this document is on the next page.

```

\documentclass[11pt, onese]{}
\usepackage{geometry}
\geometry{letterpaper}
\usepackage{graphicx}
\usepackage{amssymb}

%%% New Macros for the wheel and spoke notation:

\newcommand{\is}{\,\varepsilon\,}

\usepackage{tikz}

\newcommand{\lesand}{%
\raisebox{-6pt}{%
\begin{tikzpicture}
\draw (0,.3) circle [radius=0.1];;
\draw (0,0) -- (0,.2);
\end{tikzpicture}
}}

\newcommand{\lesiff}{%
\raisebox{-6pt}{%
\begin{tikzpicture}
\draw (0,.3) circle [radius=0.1];;
\draw (0,0) -- (0,.2);
\draw (0,.4) -- (0, .6);
\end{tikzpicture}
}}

\newcommand{\lesthen}{%
\raisebox{-6pt}{%
\begin{tikzpicture}
\draw (0,.3) circle [radius=0.1];;
\draw (0,0) -- (0,.2);
\draw (0,.4) -- (0, .6);
\draw (0.1, 0.3) -- (0.3, 0.3);
\end{tikzpicture}
}}

\title{Le\'sniewski's Wheel and Spoke Notation}

```

```
\author{V.\ Frederick Rickey \quad \quad fred.rickey@me.com}
%\date{} % Activate to display a given date or no date
```

```
\begin{document}
\maketitle
```

Le\'sniewski described his wheel and spoke notation in 1939
[English translation in {\em Stanis\l{}aw Le\'sniewski.\ Collected Works},
pp.\ 669--671].
He devised it in order to precisely formulated the deductive rules of
Protothetic and Ontology, but did not use it in class or other informal situations.

```
\bigskip
```

I have created his symbols for
equivalence (\lesiff), (\lesand) and if-then (\lesthen).
By examining the macros on the next page
you should be able to create other symbols that you need.
I have also used Le\'sniewski's symbol for negation (\vdash).

```
\bigskip
```

Here is the original axiom of Le\'sniewski's Ontology using this symbolism:

```
\bigskip
```

```
$
\llcorner Aa \lrcorner \ulcorner \lesiff ( \is\{Aa\}\, \lesand (\vdash(
  \llcorner B \lrcorner \ulcorner\vdash (\is\{BA\})
  \urcorner)
\hfil\break
  {\hskip 1.55in \llcorner BC \lrcorner \ulcorner\lesthen
  (\lesand(\is\{BA\} \is\{CA\})\is\{BC\})\urcorner
\hfil\break
  {\hskip 1.55in \llcorner B \lrcorner \ulcorner (\lesthen(\is\{BA\} \is\{Ba\})\urcorner)
\urcorner
$
```