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PRIMITIVITY IN MEREOLOGY. II

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CHAPTER IV: CARDINAL-DEPENDENT PRIMITIVE TERMS

The results in this chapter arose from consideration of the term **w-dscr** . We notice that **w-dscr**, where restricted to names of cardinality less than three, is not primitive, i.e., the primitivity of **w-dscr** demands there be more than two objects. In this chapter we define a sequence of terms which are primitive provided a certain number of objects exist.* We begin with the definition of **sbstm**. Intuitively, **sbstm** $\{b\}$ means that b is a model for mereology. The definition states that b is closed under the terms **Kl** and $\backslash$, that is, relative complement.

D25 $[b] \therefore \textbf{sbstm}\ \{b\} .\equiv: [a] : a \subset b .\supset . \textbf{Kl}(a) \subset b . \textbf{Kl}(b) \backslash \textbf{Kl}(a) \subset b$

Notice that if **pr**, **Kl**, and = are restricted to b and **sbstm** $\{b\}$, then b satisfies the axioms of mereology. Henceforth, if we state **sbstm** $\{b\}$ in a hypothesis, we will assume we are working within that subsystem unless otherwise indicated. For this reason, in the proof lines we will also merely note results as they are stated in previous theorems, without explicitly showing they are restricted. Occasionally, for clarity we will indicate exactly which subsystem we are working in with subscript notation, e.g., $\textbf{pr}_a$, $\textbf{Kl}_a$, etc.

T197 $[A] : A \varepsilon A .\supset . A \varepsilon \textbf{Kl}(\textbf{el}(A))$ [*D2*]
T198 $[A] : A \varepsilon A .\supset . \textbf{sbstm}\ \{\textbf{el}(A)\}$
PR $[A] \therefore \text{Hp}(1) .\supset :$
2. $A \varepsilon \textbf{Kl}(\textbf{el}(A)) :$ [1; *T197*]
3. $[b] : b \subset \textbf{el}(A) .\supset . \textbf{Kl}(b) \subset \textbf{el}(\textbf{Kl}(\textbf{el}(A))) :$ [*T11*]
4. $[b] : b \subset \textbf{el}(A) .\supset . \textbf{Kl}(b) \subset \textbf{el}(A) :$ [2; 3]
5. $[b] : b \subset \textbf{el}(A) .\supset . \textbf{Kl}(\textbf{el}(A)) \backslash \textbf{Kl}(b) \subset \textbf{el}(A) :$ [4; *D11*]
$\textbf{sbstm}\ \{\textbf{el}(A)\}$ [4; 5; *D25*]

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