Difference need equality

Etter’s membership and Identity

Equality

T(x,y,z) is the predicate ($y \in x \land z \in x$), so we can say that equality between two element is a relation of membership to the same set. In the following of the article we named $y \in x$ with a and $y \notin x$ with !a (not a).

AXIOMS:
1) $T(x, y, y) \Longleftrightarrow (y \in x \land y \in x)$
   (a=>a) && (a=>a)
2) $T(x, y, z) \Longleftrightarrow T(x, z, y)$
   ((a&&b) => (b&&a)) && ((b&&a)=>(a&&b)))
   Change $\land$ with && and $z \in x$ with b. (=> means implies)
3) $T(x, w, y) \land T(x, y, z) \Rightarrow T(x, w, z)$
   (c&&a) && (a&&b) => (c&&b)
   Change $w \in x$ with c

T(x,y,z) is similar to Etter’s x(y=z) in set theory.

Difference

This definition of difference is based on the simple principle that we can say that Islam is different from Christianity only and exclusively because both are religion, so two concepts must first be the same in one aspect to be perceived different on another. Thus the difference between two elements y and z, is between three sets X, Q, S. X is common to y and z, y is a member of Q but not of S, z is a member of S but not of Q.

Define R as:

$$
\begin{aligned}
R(r,x,y,z) \Longleftrightarrow\ & T(r,y,y) \land \\
& (T(r,y,y) \Rightarrow T(x,y,z)) \land \\
& (T(r,y,y) \Rightarrow \neg T(r,z,z))
\end{aligned}
$$

we can say:

$R(q,x,y,z) \wedge R(s,x,z,y) =$

((yEr) && ((yEr)=>(yEx && zEx)) && ((yEr)=>!(zEr)))   &&
((zEs) && ((zEs) =>(yEx && zEx)) && ((zEs)=>!(yEs)))

Replacing relation with boolean variable we obtain:

((c) && (c=>(a&&b)) && (c=>!d)) &&
((f) && (f=>(a&&b)) && (f=>!e))

(a && b && c && !d && !e && f)

So we have:

$Diff(q,s,x,y,z) \Leftarrow\!\!\!\Rightarrow R(q,x,y,z) \wedge R(s,x,z,y)$

We have proved by construction that the difference between y and z, their different membership respectively, to Q and S, needs the equality of y and z, their same membership to X.

$Diff(q,s,x,y,z) \Rightarrow T(x,y,z)$

Diff(q,s,x,y,z) is similar to Etter's x(y!=z) in set theory. In "Expressive equality" [ref 3] the relationship of membership changes with that of isomorphism.

Also Diff(q,s,x,y,z) is similar to what Ernst Cassirer defined as a symbol. Each symbol used by two people y and z contains an equality, x, on which the communication is based and the differences q and s, on which the uncertainty of communication is based.

References

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