Stone space type lattice logic model

From: Haykazyan, L. (2017). Spaces of types in positive model theory. arxiv.org/pdf/1711.05754.pdf

We assume the apparatus of the Meth8 modal logic model checker implementing variant system VŁ4. Meth8 allows to mix four logical values with four analytical values. The designated *proof* value is T.

Definition	Axiom	Symbol	Name	Meaning	2-tuple	Ordinal
1	p=p	T	Tautology	proof	11	3
2	p@p	F	Contradiction	absurdum	00	0
3	%p>#p	N	Non-contingency	truth	01	1
4	%p<#p	C	Contingency	falsity	10	2

LET: ~ Not; + Or; & And; \ Not and; > Imply; < Not imply; = Equivalent to;
@ Not equivalent to; # all; % some; (p@p) 00, zero; (p=p) 11, one

Results are the proof table of 16-values in row major horizontally.

"Example 5.8. ... To make sure this theory is countably categorical, we need to ensure that there are infinitely many points without colour. So we add a binary relation Q(x, y) (and its negation ¬Q) that will pair the points that do not have a colour. The theory asserts the following.

Q is symmetric and irreflexive:

$\forall x, y(Q(x, y) \rightarrow Q(y, x))$" (5.8.1)
(#p&#q)&((q&(p&r)) > (q&(r&p)) ; `TTTC TTTC TTTC TTTT` (5.8.2)

To ensure Eq. 5.8.1 is quantification $\forall x, y$ distributed on the literal $(Q(x, y) \rightarrow Q(y, x))$, we rewrite Eq. 5.8.2.

((#p&#q)&(q&(p&r))) > ((#p&#q)&(q&(r&p))) ; `TTTC TTTC TTTC TTTT` (5.8.3)

The truth table of Eq. 5.8.2 is identical to Eq. 5.8.3.

Eq. 5.8.2 as rendered is *not* tautologous, and hence the binary relation Q is not symmetric and irreflexive.