From Modality to Millianism

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Sentence ϕ *is true with respect to* world $w =_{def} \exists p$[(ϕ expresses p) & (in w, p)].

A variety of notions of rigidity: Where α is a designator,

α ***(metaphysically)*** *rigidly designates* $x =_{def}$ α designates x with respect to every (ancestrally) metaphysically possible world [in which x exists, and does not designate anything other than x with respect to any (ancestrally) metaphysically possible world].

α ***temporally*** *rigidly designates* $x =_{def}$ α designates x with respect to every time [at which x exists…]

α ***logically*** *rigidly designates* $x =_{def}$ α designates x with respect to every logically possible world […].

α ***absolutely*** *rigidly designates* $x =_{def}$ α designates x with respect to every world (logically possible or not) […].

α ***epistemically*** *rigidly designates* x for $S =_{def}$ α designates x with respect to every epistemically possible world for S […].

Some theses: Proper names are (metaphysically) rigid. Proper names are temporally rigid. Proper names are logically rigid.

Are proper names absolutely rigid? (*Hint*: Yes.) Are proper names epistemically rigid? (*Hint*: Of course!)

Six significant features of epistemic modality:

(1) Epistemic modality is not metaphysical. It is epistemic; (2) Epistemic modality is relative to a knowing subject S; (3) Epistemic necessity is no guarantee of apriority. (Equivalently, aposteriority is no guarantee of epistemic contingency.) Conversely, apriority is likewise no guarantee of epistemic necessity; (4) Epistemic modality is an *alethic modality*: $\forall p(\Box p \vDash p)$; (5) An epistemically possible world need not be closed under logical consequence; (6) Identity is well-behaved in metaphysically possible worlds, but goes rogue in epistemically possible worlds.

World w is *epistemically possible for* knowing subject $S =_{def}$ $\sim\exists p$([(in w, p) & (S knows $\sim p$)] $\vee$ [(in w, $\sim p$) & (S knows p)]).

Where p is a proposition and S is a knowing subject,

p is *epistemically possible for* $S =_{def} \exists w$(w is epistemically possible for S & in w, p).

p is *epistemically necessary for* $S =_{def} \forall w$(w is epistemically possible for $S \rightarrow$ in w, p).

p is *epistemically contingent for* $S =_{def}$ p is epistemically possible but not epistemically necessary for S.

***FT*:** $\vdash \forall S \forall p$[$p$ is epistemically necessary for $S \leftrightarrow$ (S knows p) $\vee$ (S knows $\sim\sim p$)].
The proof uses $\forall S \forall p$[(S knows p) $\rightarrow p$].

***CI*:** For any (ancestrally) metaphysically possible world w, and for any singular terms α and β, $\ulcorner \alpha = \beta \urcorner$ is true with respect to w iff the designatum with respect to w of α is identical with the designatum with respect to w of β.

GI*:** For any world w (ancestrally possible or not), and for any singular terms α and β, $\ulcorner \alpha = \beta \urcorner$ is true with respect to w iff the designatum with respect to w of α is identical **in *w with the designatum with respect to w of β.