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Ruth Barcan Marcus' Wittgenstein

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1 Introduction

Ruth Barcan Marcus (1921-2012), the inventor of quantified modal logic, is often neglected by historians of analytic philosophy. By contrast, Wittgenstein is celebrated and counted among the triumvirate whose members historians describe unironically as the 'founding fathers' of analytic philosophy. But there are good reasons to regard Barcan Marcus as a 'founding mother', too. I have previously argued (Janssen-Lauret 2022) that she ought to be regarded as a prominent thinker within, or even one of the major figures of, mid-century analytic philosophy, given her pioneering work on quantified modal logic (Barcan 1946), the necessity of identity (Barcan 1947), and direct reference (Barcan 1961). All of these have been described as having roots in Wittgenstein, too. In this paper I will argue that although some modal logicians and direct reference theorists took inspiration from Wittgenstein's *Tractatus*, Barcan's path to these views was independent. By contrast, Barcan Marcus herself described her later object-oriented epistemology, according to which we cannot believe the impossible, as inspired by Wittgenstein both early and late.

2 Ruth Barcan's Quantified Modal Logic and her Proof of the Necessity of Identity

Ruth Barcan was born in 1921, the year that Wittgenstein published his *Logisch-Philosophische Abhandlung* (Wittgenstein 1921), translated into English the following year as the *Tractatus Logico-Philosophicus* (Wittgenstein 1922). Just 24 years later, Barcan, still a graduate student, published the world's first symbolic quantified modal logic (Barcan 1946). The year after, she proved the necessity of identity (Barcan 1947).[1]

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[1] Although she was already married to Jules Marcus at the time, her preference was to publish as Ruth Barcan. But when she sent her review of Smullyan to the *Journal of Symbolic Logic*, 'Church [the editor] informed me testily that he had learned I was married and must heretofore use my "legal" name' (Barcan Marcus 2010: 82). Out of respect for Barcan's preference, I shall use the names 'Barcan' and 'Barcan Marcus' for her, and not refer to her as just 'Marcus'.

Barcan's quantified modal logic was a controversial invention at a time when analytic philosophers, including those influenced by Wittgenstein's *Tractatus* such as Russell and the early Carnap, overwhelmingly adhered to extensionalism. Extensionalists felt that a properly scientific philosophy reckons with things as they are, not as they may or must be. They therefore rejected modal and intensional constructions. *Principia Mathematica*, the *Aufbau*, and the *Logical Syntax of Language* were hailed as models of extensionalised, mathematised objectivity (e.g. Quine 2018 [1944]: 185). The early Carnap cited the *Tractatus* 4.4ff as an important source of the 'thesis of extensionality' (Carnap 1928 §43; Carnap 1937: 245), and credited Wittgenstein with shifting Russell's position towards a more radical extensionalism in his Introduction to the *Tractatus* (Carnap 1928 §43).

Inspired by Russell's and Carnap's extensionalist successes, in turn inspired by Wittgenstein, Quine had attempted to dispense with the modal operators 'necessarily' and 'possibly' by paraphrasing them away in terms of analyticity. He sought to reduce modal contexts to a kind of quotation contexts by assuming the equivalence, 'the result of applying "necessarily" to a statement is true if, and only if, the original statement is analytic' (Quine 1943: 121). If this were the correct analysis of modality, then statements in which a modal operator occurs in the scope of a quantifier would be effectively banned. 'Necessarily, mathematicians are rational' would mean that the predicate 'is rational' forms part of the meaning of the term 'mathematicians'. By contrast, a sentence like 'There is something which is necessarily rational' would either be meaningless, without determinate logical form (Quine 1943: 124), or simply a mistake, a use-mention confusion, because non-linguistic entities such as rational animals do not have meanings; 'only linguistic forms have meanings' (Quine 1951: 22).[2]

Barcan boldly proposed a system which counted among its main axioms one prominently featuring a modal operator, $\Diamond$, in the scope of the quantifier '$\exists$':

$\Diamond \exists x$ A $\dashv\vdash \exists x \Diamond$ A (Barcan 1946: 1).

It has since become famous in the form '$\Diamond \, \exists x(Fx) \rightarrow \exists x \Diamond (Fx)$' and under the name 'the Barcan Formula', although it is strictly speaking not a formula, but an axiom schema. The Barcan Formula provides a smooth and elegant way of integrating quantification into the sentential modal logics of C.I. Lewis (1918), built around Lewis's invention, the '$\dashv$' operator. Lewis's 'p $\dashv$ q' is equivalent to '$\Box$ p $\rightarrow$ q', that is, 'necessarily, if p then q'. Barcan deployed first-order quantified S2 and quantified S4 in her 1946, and second-order QS2 and QS4 in her 1947, extending Lewis's S2 and S4 not just with the Barcan Formula but also with rules and axioms for first- and second-order quantification, which allowed her to prove over 80 theorems in Barcan 1946, most of them containing quantifiers. Quine had to admit that her system was coherent and 'scrupulous over the distinction between use and mention' (Quine 1946: 97).

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[2]For an interpretation of Quine according to which attributing a predicate analytically to an individual is senseless due to indeterminate logical form, see Neale 2000, and for the interpretation according to which attributing a predicate analytically to an individual constitutes a use-mention confusion, see Janssen-Lauret 2022: 376-377.

Both Barcan 1946 and Barcan 1947 are highly technical, consisting of almost nothing but proofs, and containing no discursive material on the philosophy of modality. But the title of Barcan's 1947 announced that she would prove 'the identity of individuals' in second-order modal logic (Barcan 1947). Barcan's first necessity of identity proof was strictly speaking a proof of the necessity of indiscernibility. She defined the identity relation, I, as the set of all pairs $\langle \alpha_1, \alpha_2 \rangle$ such that necessarily, for any property, if α_1 has it then α_2 has it. Barcan then proved that in second-order quantified S4, the I-relation is necessarily equivalent to the I_m-relation, which is the set of all pairs $\langle \alpha_1, \alpha_2 \rangle$ such that for any property, if α_1 has it then α_2 has it. So Barcan was satisfied that identity claims are never contingently true. A true identity claim is true necessarily.[3]

3 Was the Early Barcan Inspired by the Early Wittgenstein?

Is there a Wittgensteinian connection at work in Barcan's quantified modal logic, or her proof of the necessity of identity? Some say 'yes', notably including David Wiggins (1974, 2003) and Jaakko Hintikka and Gabriel Sandu (1995) but I will argue that there is no strong reason to think so. First, in addition to the extensionalist reading of the *Tractatus* which I referenced above—adhered to by Russell (1922), Carnap (1928 §43, 1937: 245), and Black (1964: 219) amongst others—there is a competing interpretation of the early Wittgenstein as an ancestor of modern symbolic modal logic, advanced by the later Carnap (1947), Copeland (2002) and Prior (2003) amongst others. But on that interpretation, what Wittgenstein is thought to have foreshadowed is the possible-world interpretation of quantified modal logic. Barcan's 1946-7 quantified modal system provided no interpretation, but was, as Quine wrote approvingly, 'explicitly metamathematical' (Quine 1946). Barcan had not been educated in a philosophical or (meta-)mathematical tradition which was much influenced by Wittgenstein, and there is no evidence that she was familiar with the possible-world-theoretic reading of the *Tractatus*. Second, Barcan's necessity of identity proof is sometimes connected to the theory of identity in the *Tractatus*. But again, there is no evidence that Wittgenstein influenced Barcan in this regard.

In the *Tractatus*, Wittgenstein characterised the truth-conditions of logical truths and falsehoods as truth and falsity (respectively) in all possible combinations of *Sachverhalte*, translated as 'atomic facts' by Ogden, 'states of affairs' by Pears and McGuinness. Wittgenstein wrote,

> 'If the elementary proposition is true, the atomic fact exists; if it is false the atomic fact does not exist. The specification of all true elementary propositions describes the world completely. The world is completely described by the specification of all elementary propositions plus the specification, which of them are true and which false

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[3] For more detailed ordinary-language explanations of Barcan 1946 and Barcan 1947, see Janssen-Lauret 2022.

> ... Among the possible groups of truth-conditions there are two
> extreme cases. In the one case the proposition is true or all the
> truth-possibilities of the elementary propositions. We say that the
> truth-conditions are *tautological*. In the second case the proposi-
> tion is false for all the truth-possibilities. The truth-conditions are
> *self-contradictory*.' (1922: 4.25-26, 4.46)

Carnap credited Wittgenstein's characterisation with inspiring his modal seman-
tics of state-descriptions. He wrote, 'the state-descriptions represent Leibniz'
possible worlds or Wittgenstein's possible states of affairs' (1947: 9). Mered-
ith's and Prior's possible world interpretation, traced back to 1956 by Copeland
(2002, 2006) was also influenced by Meredith's reading of the *Tractatus* (Prior
2003, 219). But Barcan's proof-theoretic system stands aloof from the develop-
ment of modal semantics inspired by the *Tractatus*. Her work lay in a separate,
American tradition of modal logics.

The late-Carnap-Meredith-Prior reading of the *Tractatus* is not one which
can immediately be gleaned from Wittgenstein's text. This much is apparent
from the fact that the rival, extensionalist reading of the *Tractatus* was not only
mainstream, but even maintained by different time-slices of the same person
(namely Carnap). To extract a potential modal semantics from the *Tractatus*
the reader must mix his or her labour with the text in a painstaking way.
Barcan does not appear ever to have been so steeped in the *Tractatus* as to
extract the state-description view of modality from it. One reason to think so
is that, as we'll see below, Barcan had a different interpretation in mind for
her system, an interpretation which she did not discuss in print until 1961. A
second reason is that the later Barcan Marcus never mentions a possible-world
or state-description interpretation whenever she mentions the *Tractatus*. When
she discusses forerunners of possible-world theories, she does mention Carnap
and C.I. Lewis, but not Wittgenstein. She attributes to the early Wittgenstein
the view that 'impossible propositions are meaningless' (Barcan Marcus 1993:
147 fn.5). In a later paper, she elaborates,

> Wittgenstein is concerned in the *Tractatus* with those necessities
> and impossibilities that are given by tautologies and contradictory
> propositions of *whatever* complexity. He argues that a *significant*
> proposition has to describe a definite situation such that the situa-
> tion may or may not obtain. A proposition must admit an alterna-
> tive truth value. Where a propositions does not admit alternative
> values, i.e. is not contingent, he says it lacks sense' (Barcan Marcus
> 1993: 252-253).

But Barcan Marcus expresses disagreement with Wittgenstein, thus interpreted:
'tautologies and contradictions are surely meaningful' (Barcan Marcus 1993:
253). Another reason to think that the young Barcan was never so immersed
in early Wittgenstein as to consider the late-Carnap-Meredith-Prior reading is
that what we know of her education provides no evidence of any strong Wittgen-
steinian influence or detailed study of the *Tractatus*.

Barcan, a secular Jewish New Yorker who double-majored in philosophy and mathematics at NYU, discovered modal logic by studying C.I. Lewis with her mathematics professor J.C.C. McKinsey. Looking back on her undergraduate years, she mentions reading Plato, Aristotle, Kant, Aquinas, even British Hegelianism, some forms of logical empiricism, but no Wittgenstein or Wittgensteinians among the philosophy she studied with Burnham, Hofstadter, and Hook. Hook occasionally mentioned Wittgenstein, but never in connection with possible combinations of *Sachverhalte* (Hook 1927: 431, Hook 1939: 128). Barcan went to NYU while still very young, and began to consider graduate work in modal logic as an eighteen-year-old (Barcan Marcus 2010: 80). She was just 20 when, in 1941, she arrived at Yale for graduate study. There she worked primarily on logic with F.B. Fitch, but also on Kant and Leibniz with Cassirer and on philosophy of science with Northrup and the physicist Margenau. She avidly read *Principia Mathematica* and the early Russell (his *Principles* and *Introduction to Mathematical Philosophy*), but makes no mention of the *Tractatus*.

In the young Barcan's philosophical context, Wittgenstein was not such a towering figure as he is in our conventional narrative of analytic philosophy. The *Tractatus* had borne a great influence on Russell's logical atomism and on the Vienna Circle, especially on its 'right wing'. But in late 1930s-early 1940s North America, the *Tractatus*' main advocates were the logical empiricist immigrants influenced by Wittgenstein who had managed to escape Nazi-occupied central Europe. The conventional narrative tends to describe the arrival of these refugees as the moment analytic philosophy reached American shores (Beaney 2013: 15). Yet American logicians like Barcan—though as a left-wing Jewish woman she was undoubtedly sympathetic to the refugees—would not have viewed matters that way. She named Russell, Lewis, and even Austin as philosophical influences, but not Wittgenstein or his followers (Barcan Marcus 2010: 78).

As I noted above, Barcan presented no interpretation, in particular no possible-world interpretation, for her quantified modal logic in the 1940s, but proceeded in a purely proof-theoretic way. This was not because she had not considered the question of how modal logic applies to reality. In a nutshell, Barcan did not think that modal logics described possible worlds, but rather that they allow us to discuss actual existents counterfactually. We can refer directly to individuals, known by acquaintance, using proper names or 'tags' which feature in necessarily true statements of identity. Modal discourse is used to speak about how those individuals might have been or might have behaved. Although Barcan did not publish these views until 1961, her PhD supervisor Fitch attributes them to her (Fitch 1950: 252), and Quentin Smith recounts that Barcan told him in an interview that she first developed these views in 1943-45, while writing her PhD (Smith 1995: 219).

Hintikka and Sandu see an anticipation of Barcan's 'constant domain of individuals' (Hintikka and Sandu 1995: 266) in the *Tractatus*. They allege that Wittgenstein's view is very much preferable to Barcan's because her view 'implies that it is some class of individuals such that it is logically (conceptually,

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metaphysically) impossible that there should exist other ones ... an unintuitive and arbitrary assumption', while by contrast Wittgenstein's objects 'are given to me directly and fully' (Hintikka and Sandu 1995: 266). But Hintikka and Sandu are confusing Barcan's modal logic with Kripke's possible-world interpretation here. Barcan's objects, as we shall see, are directly given to us in experience in exactly the way which Hintikka and Sandu approve of. As Barcan never posited possible worlds, she was not beholden to the assumption which they find unintuitive and arbitrary.

A possible-world or state-description interpretation of the type late Carnap, Meredith, and Prior extract from the *Tractatus* would in addition sit uncomfortably with Barcan's preferred reading of the Barcan Formula, namely 'if it is possible that something is F, then something is possibly F'. On an interpretation where we are speaking counterfactually about actual existents, the Barcan Formula appears true. On a possible-world interpretation, by contrast, the Barcan Formula is read as 'if in some possible world something is F, then in the actual world there is something which is possibly F'. The latter is at odds with most modal metaphysicians' belief in mere possibilia, objects which could exist but do not actually exist. But Barcan never came to believe in mere possibilia (Barcan Marcus 1976).[4]

Wiggins, like Hintikka and Sandu (1995: 272), hints at a Tractarian influence on Barcan's proof of the necessity of identity. Wiggins writes,

> 'Ramsey supposed that true statements of the form 'a = b' would have to be necessary truths. Ruth Barcan Marcus, who appears to have been the first to present a formal derivation of (4), $[(\forall x)(\forall y)(x = y \to \Box x = y]$[5] has long accepted this conclusion and defended it on lines strongly reminiscent of *Tractatus Logico-Philosophicus* 4.243.' (Wiggins 1974: 326)

In a footnote, he refers the reader to the final page of Barcan 1947. Wiggins does not elaborate further on why he sees a link between Barcan's proof, which is purely formal and contains no prose elucidation, and the part of the *Tractatus* which ends,

> Expressions like "a = a", or expressions deduced from these are neither elementary propositions nor otherwise significant signs (Wittgenstein 1922: 4.243).

We have seen that Barcan held that identity is a necessary relation, and that 'tautologies ... are surely meaningful' (Barcan Marcus 1993: 253). Barcan Marcus' papers sometimes use 'tautology' as a synonym for 'logical truth', and in earlier works she was happy to call 'a = a' a tautology (Barcan Marcus 1961:

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[4]Some modal metaphysicians combine the Barcan Formula with a possible-world interpretation of modal logic, leading to the conclusion that everything exists necessarily (Linsky and Zalta 1994, Williamson 2012).

[5]I have slightly modernised the notation in Wiggins' (1974: 324) formulation of the necessity of identity.

308).[6] So it is clear that she would not agree with *Tractatus* 4.243. Hintikka and Sandu again allege that the *Tractatus'* account is much preferable to Barcan's, because on Wittgenstein's account 'a posteriori necessary identities disappear with a slight change of notation' although it remains the case that 'all identities between simple objects are necessary' (Hintikka and Sandu 1995: 273). They have in mind, I assume, the following passages from the *Tractatus*:

> 'Identity of the object I express by identity of the sign and not by means of a sign of identity' ... to say of *two* things that they are identical is nonsense, and to say of one thing that it is identical with itself is to say nothing' (Wittgenstein 1922: 5.53, 5.5303).

Barcan's 1947 paper, being entirely formal, does not contain any prose arguments to determine what she would have said in response. It is possible that Wiggins and Hintikka and Sandu have in mind instead the philosophical arguments of Barcan's 1961 'Modalities and Intensional Languages', which they cite alongside her 1947, and to which I turn next.

4 Barcan Marcus' 1961 Views on Identity and Direct Reference Theory

In her 1961, Barcan Marcus considered primitive identity in addition to identity defined in terms of indiscernibility. In defence of her appeal to primitive identity, she wrote, 'at bottom my appeal is to ordinary language, since although it is obviously absurd to talk of two things being the same thing, it seems not quite so absurd to talk of two things being indiscernible from one another' (Barcan Marcus 1961: 305). She also enriched her formalism by explicitly considering proper names—both formal-language constants 'a', 'b' and ordinary-language ones such as 'Venus' and 'Napoleon'—as well as the variables 'x', 'y', 'z' to which she confined herself in her 1947. Barcan Marcus' 1961 paper contains prose explications in addition to formal proofs. Like in her 1947, she continued to use the symbol 'I', rather than the '=' sign, for identity. Her philosophical defence of the necessity of identity proceeded as follows,

> Consider the claim that
> (13) aIb
> is a true identity. Now if (13) is such a true identity, then a and b are the same thing. It doesn't say that a and b are two things which happen, through some accident, to be one. True, we are using two different names for that same thing, but we must be careful about use and mention. If, then, (13) is true, it must say the same thing

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[6]Barcan Marcus notes in the 1993 reprint of her 1961 that she meant 'tautology' in the sense of 'logical truth', not in the sense of 'analytic truth'. This usage is one she shared with Wittgenstein but did not derive directly from him; she describes it as having been common practice at the time (Barcan Marcus 1993: 4) In 1993, she replaces the occurrences of 'tautology' in the passage quoted above with 'valid' (Barcan Marcus 1993: 10).

as

(14) aIa.

But (14) is surely a tautology, and so (13) must surely be a tautology
as well.' (Barcan Marcus 1961: 308).

Barcan Marcus' audience would have found this view peculiar, being familiar
with Frege's problem of the morning star and the evening star, and the solution
given in the modal logic of Carnap. Carnap maintained that statements with a
logical form equivalent to 'a = a' were analytic, and therefore necessarily true
(Carnap 1947: 13-15), but that 'the identity sentence "the morning star is the
same as the evening star"' (Carnap 1947: 134) is true only contingently.

Barcan Marcus took a different view. She defended the necessity of identity
by appeal to her direct reference theory of proper names. Our initial impression
that 'the morning star is the evening star' is a contingent identity, she argued
persuasively, derives from its ordinary-language ambiguity. It has one disam-
biguation on which it expresses an identity, and one on which it is contingent,
but none on which it is a contingent identity. On the first disambiguation, the
'is' occurring within it is the 'is' of identity. If this is the case, then 'the morn-
ing star' and 'the evening star', flanking the 'is' of identity, are proper names
without discursive meaning. Each 'simply tags' (Barcan Marcus 1961: 310) the
planet Venus, and does no more. In this case, the statement is a true identity,
saying that the morning star and the evening star are the same thing, and is
therefore necessary. On the other disambiguation, the 'is' expresses a contin-
gent relation, weaker than identity. On that reading 'the morning star' and the
evening star' are descriptions equivalent to 'the first star visible in the morning'
and 'the first star visible in the evening'. In this case, it is contingent, but not
an identity.

In support of her direct reference view of proper names, Barcan Marcus put
forward modal arguments of the type usually credited to Kripke.

> 'Suppose through some astronomical cataclysm, Venus was no longer
> the first star of the evening. If we continued to call it alternatively
> 'Evening Star' or 'the evening star' then this would be a measure
> of the conversion of the descriptive phrase into a proper name. If,
> however, we would then regard ['the morning star is the evening
> star'] as false, this would indicate that 'the evening star' was not
> used as an alternative proper name of Venus.' (Barcan Marcus 1961:
> 309)

5   Was Barcan Marcus in 1961 Inspired by the *Tractatus*?

Wiggins' remarks quoted above, to the effect that Barcan's views on the neces-
sity of identity are reminiscent of Ramsey and Wittgenstein, fit Barcan Marcus'
1961 account better than they do Barcan 1947's formal proof, although they

do not fit it perfectly. In 1961, Barcan Marcus mentioned Ramsey, though noting that her belief that true identities are logical truths is based on her own ordinary-language argument, not on the specific argument given by Ramsey (Barcan Marcus 1961: 305). Still, major differences remain between her account and that of *Tractatus* 4.243, according to which 'a = a' is senseless, and 5.53 and 5.5303, according to which 'a = b' is senseless as well. Barcan Marcus asserted, by contrast, that the equivalent 'aIa' is a logical truth, and even that 'aIb', if true, is a logical truth, too.

Yet some connection can be drawn between Wittgenstein's rhetorical questions, 'Can we understand two names without knowing whether they signify the same thing or two different things? Can we understand a proposition in which two names occur, without knowing if they mean the same or different things?' (Wittgenstein 1922: 4.243) and Barcan's argument quoted above. Black, for example, reads Wittgenstein's rhetorical questions, once stripped of 'irrelevant psychological considerations' pertaining to knowledge, as indicating that '*a* and *b* determine either the same or difference objects, as the case may be, *prior* to verification' (Black 1964: 211), and concludes that 'W. apparently has in mind only equations connecting genuine names' (Black 1964: 210).

Although Wiggins does not discuss the preceding sections of the *Tractatus*, 2.242 and 2.241, there is some affinity between these and Barcan Marcus' view as well. For example, Wittgenstein wrote, 'If I use two signs with one and the same meaning [Bedeutung], I express this by putting between them the sign "=". "a = b" means then, that the sign "a" is replaceable by the sign "b".' (Wittgenstein 1922: 2.241), while Barcan Marcus wrote, 'symbols which name things will be those for which it is meaningful to assert that I holds between them, where "I" names the identity relation' and 'names for the same thing ... must be intersubstitutable in every context' (Barcan Marcus 1961: 304, 309). I assume that Wittgenstein here uses 'Bedeutung' in the Fregean manner, to mean 'reference', so there is some similarity between Barcan Marcus' statement and his. But there remain important differences as well as similarities, and there is still no strong evidence for direct influence.

First of all, while Barcan Marcus cited Ramsey in her 1961, and in retrospectives acknowledged influence of Russellian knowledge-by-acquaintance when she formulated the view that proper names are directly referential (Barcan Marcus 2010: 85), she never cited Wittgenstein or the *Tractatus* as a source for these particular thoughts. Second, Wiggins, like Hintikka and Sandu, does not distinguish Barcan Marcus' views sufficiently from those of Kripke. When Wiggins, having called Barcan's arguments 'strongly reminiscent of *Tractatus Logico-Philosophicus* 4.243' continues, 'That passage [i.e., *Tractatus* 4.243] depends on a special view of proper names, however' (Wiggins 1974: 326), he attributes to Wittgenstein a distinction between 'logical and other proper names' which is to be kept apart from 'rigid designators' (Wiggins 1974: 326). Although Wiggins is correct to distinguish 'common or garden' [i.e., ordinary language] proper names from logical proper names, he is wrong to amalgamate Barcan Marcus' position and Kripke's. Barcan Marcus was always explicit that necessity of identity, on her view, requires that the identity sign be flanked only by directly

referential proper names. Not all 'rigid designators', then, qualify, because some rigid designators, like 'the even prime', are descriptions. Rigid designation was not part of Barcan Marcus' account. A rigid designator is supposed to be one which denotes the same entity in any possible world. But Barcan Marcus did not believe in possible worlds. And her account of proper names sharply distinguished them from any descriptive meaning: 'This tag, a proper name, has no meaning. It simply tags. It is not strongly equatable with any of the singular descriptions of the thing' (Barcan Marcus 1961: 310).

In 2003, Wiggins writes, 'Barcan Marcus and others have returned us to the insight Wittgenstein expresses at 3.261 of the Tractatus' (Wiggins 2003: 486) The relevant line of the *Tractatus* reads: 'Names *cannot* be taken to pieces by definition' (Wittgenstein 1922: 3.261). As we have seen, Barcan Marcus certainly would have agreed in principle that her tags, directly referential proper names, could not be replaced by definitions. But the question whether Barcan Marcus' tags are the same as, or comparable to, Wittgenstein's names still has not been fully answered. Although Wittgenstein appears to believe in direct reference of a certain sort, his proper names may resemble Russell's logically proper names, 'this' and 'that' used to name a sense-datum immediately presented to us by acquaintance, more than they resemble Barcan Marcus' ordinary proper names—although we'll see even the resemblance to Russell can be questioned.

Wiggins himself already gestured towards the difference between logical and common or garden proper names as a difference between Wittgenstein's and Barcan Marcus' respective accounts. Some interpretations of the *Tractatus* connect 3.261 with the subsequent passage 3.263, in which 'primitive signs', that is, names, are said to be 'understood when the meanings of these signs are already known [bekannt].' Since the German 'bekannt', a conjugation of *kennen* rather than *wissen*, connotes knowledge by acquaintance, 3.261 and 3.263 together can form the basis of an 'empiricist' interpretation where Wittgenstein's names, like Russell's logically proper names, are taken to refer to a sense-datum or, in Popper's words, an 'observation statement' (Popper 1957: 164). We saw above that Hintikka and Sandu read the *Tractatus* this way. But their reading is controversial. According to Anscombe's influential interpretation, the empiricist reading of the *Tractatus* is not true to the text. Anscombe argues that while we must take 3.262 as evidence that Wittgenstein's names are 'logically simple signs' for units much smaller than those denoted by common or garden names such as personal names (Anscombe 1959: 36-7), and 'the meaning of a simple sign is its bearer' (Anscombe 1959: 46), Wittgenstein's view of names diverges from Russell in that it is not connected to knowledge by acquaintance or observations. Direct reference is necessary only to ensure that elementary propositions have truth values, because the name-object relation ensures that language can 'hook on to the world' (Anscombe 1959: 44).

By contrast, Barcan Marcus' views on proper names are strongly linked to empiricism and knowledge by acquaintance. By contrast to Wittgenstein, Barcan Marcus maintained that Russell, far from being incautious in linking direct reference with the epistemology of acquaintance, was in fact overly cautious in limiting its scope only to sense-data (Barcan Marcus 2010: 84-85). According

to Barcan Marcus, we have reason to trust that ordinary proper names are directly referential names for their bearers—persons, animals, planets, etcetera—because we are capable of standing in the acquaintance relation to persons, animals, planets, and the like (Barcan Marcus 1978). Barcan Marcus' flavour of empiricism rested on the assumption that our minds can reach out and grasp ordinary concrete things directly (Janssen-Lauret 2015, 2016). Acquaintance, on her view, extends beyond sense data, even if sense data are thought of, as Russell and Moore at times held, as the surfaces of objects (Moore 1925: 56). Barcan Marcus believed in knowledge by acquaintance of whole concrete objects, which we can subsequently assign a name. For those sympathetic to Anscombe's reading of the *Tractatus*, then, Barcan Marcus' views are thus revealed to be further removed from Wittgenstein's than they may at first sight appear, both because her directly referential names are ordinary proper names and because they remain firmly connected to knowledge by acquaintance.

6   Later Barcan Marcus on Belief and Impossibility: Inspiration from Wittgenstein

In her later work, Barcan Marcus argued against the 'linguistic' account of belief, according to which having a belief requires having an attitude towards a sentence or a Fregean proposition, that is, a linguistic or quasi-linguistic entity. Barcan Marcus proposed instead an account of belief according to which those who hold a belief are related to actual objects in the world. In the case of a true belief, a subject is related to actual objects in a structure in which those objects are actually arranged, and is disposed to act as if they are indeed so arranged. In the case of a false belief, the subject is related to actual objects, but is disposed to act as though those objects are arranged in a structure which does not actually obtain (Barcan Marcus 1990: 140), a view reminiscent of Wittgenstein's picture theory.

Barcan Marcus was inspired to propose this position by the logical atomism, not just of Russell, but also of Wittgenstein. Like Wittgenstein, she maintained that we can only have beliefs about 'a definite situation which allows that the situation may or may not obtain' (1990: 151). She was also influenced by Russell's multiple-relation theory. 'For Russell, believing relates the agent to the *constituents* of the proposition', Barcan Marcus wrote, and because '"Propositions" for Russell contain non-linguistic constituents', he held an 'object-oriented view of epistemological attitudes' (Barcan Marcus 1990: 139, fn. 7-8). Barcan Marcus drew further inspiration from Ramsey, who proposed that we may 'to a chicken who has acquired an aversion to eating a species of caterpillar on account of prior unpleasant experiences ... attribute the belief that the caterpillar is not for eating' (Barcan Marcus 1990: 135). Although Barcan Marcus does not mention him in this connection, the later Wittgenstein would also have agreed. In his *Philosophical Investigations*, he wrote, 'A dog believes his master is at the door' (Wittgenstein 1967: 174).

11

The fact that it enables us to attribute thoughts and beliefs to animals and non-verbal children in exactly the same sense as to language-users is one main advantage Barcan Marcus saw for her account. Our common-sense judgement is inclined to say, when a man and his dog both run towards the appearance of water in the desert, that they share a belief that there is something drinkable there (Barcan Marcus 1990: 134-5). But if having a belief requires us to speak a language, then we must either, as Davidson held , deny outright that animals have beliefs, despite the behavioural similarities between the man and the dog, or we must attribute to dogs a kind of inner language, a 'language of thought' (Fodor 1975), to account for their beliefs, or we must say that our ascription of beliefs to the dog is not literally true, but only a tentative hypothesis or an analogy.[7] Barcan Marcus found all of these options unsatisfactory. She held instead that animals have some beliefs, those expressible in non-linguistic behaviour, but that 'Naturally non-language users will fail to have beliefs only possible to language users' such as 'second order conceptualization and reflection' (Barcan Marcus 1990: 140, 152). There are clear affinities with Wittgenstein's thought here. Wittgenstein, too, thought that animals could be ascribed beliefs, but only simple beliefs, not those involving, for example, reference to 'tomorrow' (Wittgenstein 1967: 166, 174). Barcan Marcus occupied what Glock calls the 'Wittgenstein-common sense' position on animal beliefs (Glock 2000: 36), although unfortunately Glock does not mention her as one of its defenders.

Lastly, Barcan Marcus drew explicitly upon Wittgenstein in support of her thesis that we cannot believe an impossibility. Barcan Marcus foresaw an objection to that thesis: granted that we cannot believe a claim which states an obvious contradiction or impossibility, but surely we can believe, for example, that George Eliot is distinct from Mary Ann Evans? To rebut this objection, Barcan Marcus turned to Wittgenstein's works, both early and late. First, she appealed to the *Tractatus* view that 'a *significant* proposition has to describe a definite situation which allows that the situation may or may not obtain' (Barcan Marcus 1990: 151).[8] She then quoted the *Tractatus*, 'Tautologies and contradictions ... do not represent any possible situations' (Wittgenstein 1922: 4.462, qtd. in Barcan Marcus 1990: 151). This quotation provided the basis of Barcan Marcus' rebuttal of the claim that we can believe disguised impossibilities such as false statements of identity.

> '[I]f what informs his [early Wittgenstein's] argument is that it is
> the impossibility of a proposition S being false or the impossibility
> of a proposition S being true which makes it an improper object of
> a propositional attitude, then the *origin* of those attitudes should

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[7]Hans-Johann Glock attributes the second option to 'those cognitive psychologists who explain even simple animal behavior by reference to a rich variety of complex thoughts and calculations, except that these thoughts are held to be in a language of thought, not in a public language' (Glock 2000: 35). Bede Rundle takes the third option (Rundle 1997: ch.4).

[8]In her first paper which defended an object-based account of belief, Barcan Marcus likewise noted that a version of her view was to be found in the *Tractatus*, according to which 'impossible propositions are meaningless, i.e. they have no cognitive content' (Barcan Marcus 1983: 327 fn. 4).

> not matter. A false identity claim, for example, is necessarily false, never mind how it was arrived at' (Barcan Marcus 1990: 151).

Although Barcan Marcus continued to reject the component of the *Tractatus* view according to which tautologies and contradictions are meaningless, she felt drawn to the later Wittgenstein, who held, like her, that logical truths were meaningful, but that we cannot believe an impossibility. Instead, according to her reading, the later Wittgenstein distinguished between believing and merely claiming to believe impossibilities. Barcan Marcus quoted his *Remarks on the Foundations of Mathematics*: 'I feel a temptation to say one can't believe 13 x 13 = 196 ... But at any rate I can say "I believe it" and act accordingly' (Wittgenstein 1956: 106, qtd. in Barcan Marcus 1990: 151). Barcan Marcus endorsed the believing vs. claiming to believe distinction, and held that it was the latter which was at work when someone makes an assertion which expresses an impossibility. Someone who is rational and at some point assented to the statement that, for example, George Eliot is not Mary Ann Evans, must retract her claim to have believed that when she finds out that 'George Eliot = Mary Ann Evans' is a true identity. A rational agent 'might say that she only claimed to believe that ... for such a belief comes to believing of a thing that it is not the same as itself and that does not meet logical norms of rationality' (Barcan Marcus 1990: 152). Barcan Marcus settled on a position that, though also inspired by the *Tractatus*, most closely resembles the later Wittgenstein's proposal: contradictions and tautologies are meaningful but we cannot really believe an impossibility.

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