What to do when the world splits in two

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- Prudential rationality. Angier doesn't care if someone dies unless it's him.

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- Was Angier's decision rational?
- How should decisions of this shape be made?
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- Applications to the literature on Everettian quantum mechanics.

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- The approach of Saunders and Wallace combines the following two ideas
  - A Lewisian approach to the metaphysics of persistence, worms, and personal fission. (This characterisation is near enough for our purposes.)
  - The idea that one can have irreducibly self-locating uncertainty, even if one knows all the facts (in the sense that one knows exactly which possible world one inhabits.)

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   - But a second worry comes up: this account potentially creates too much uncertainty, for example if there are many different objects colocated with me with different modal profiles (for statue lump type reasons.)
3. (Williams): To have a complete story of uncertainty we need to account for uncertainty about things that might happen long after I cease to exist - it is hard to see how being uncertain which branch I am located in can generate this, since that uncertainty can only be responsible for uncertainty in events up until my death.

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- This requires **Measurement Neutrality**. This principle is equivalent to saying that you should set your credence's according to the Born rule (against the background of an appropriate Savage style decision theory.)
- Ignoring the details, MN implies we must have situations where we assign successors different probabilities or the project won't get off the ground. [Draw a picture.]

The principle of indifference

"Dear Sir,
(Forgive the impersonal nature of this communication – our purpose prevents us from addressing you by name.) We have just created a duplicate of Dr. Evil. The duplicate – call him 'Dup' – is inhabiting a replica of Dr. Evils battlestation that we have installed in our skepticism lab. At each moment Dup has experiences indistinguishable from those of Dr. Evil. For example, at this moment both Dr. Evil and Dup are reading this message. We are in control of Dup's environment. If in the next ten minutes Dup performs actions that correspond to deactivating the battlestation and surrendering, we will treat him well. Otherwise we will torture him.
Best regards, The PDF"

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- **Self-locating Indifference** You should distribute your credence's equally over similar centred worlds.
- (In particular, if you are certain that you are in one of two centred worlds, like we may suppose Dr. Evil is, you should give credence $\frac{1}{2}$ to each.)

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- Note: it might be vague how many duplicates there are (due to vagueness in the decoherence basis.)
- But in most cases, it'll be supertrue that you ought not set your credence's according to the Born rule. (E.g. if the mod amplitude squared is an irrational number. Elga's principle never recommends an irrational credence.)

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- The claim: you may know exactly which possible world you inhabit, and even know exactly where you are located in that world and yet still be uncertain about some things.
- In particular, suppose you can see that Cedric is clearly bordering on the bald. Even if you know all the relevant facts (such as how many hairs he has on his head, how people use the term 'bald', etc...) you can still be uncertain whether Cedric is bald.

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- A world where time is branching, but the language users speak as if there were exactly one branch seems like a world where there are many good candidate interpretations for the language: each a linear branch.

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  - $\lhd \rhd p \rightarrow (\lhd p \vee p \vee \rhd p)$

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A **model** is a triple $\langle P, \leq, V \rangle$, where $\langle P, \leq \rangle$ is a frame, and $V : \mathcal{SL} \times P \times \mathcal{B} \to 2$.

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- The clauses for $\neg$, $\wedge$, $\vee$, $\rightarrow$ and sentence letters are standard.
- A sentence is **supertrue** in $\mathcal{M}$ at a time t iff $\mathcal{M}, b, t \models \phi$ for every branch b such that $t \in b$.

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- Obliteration: on one branch I get obliterated, on another I live on so it's indeterminate whether I get obliterated. So I should be uncertain whether I'll get obliterated.
- Uncertainty about the distant future: the uncertainty due to indeterminacy has nothing to do with the length of your worms. Will still be indeterminate whether robots take over the earth, whether we live long enough to see it or not.

Vagueness and uncertainty

- Suppose you know everything there is to know that's relevant to whether Cedric is bald: how many hairs he has, their distribution, colour, etc... and suppose you're certain he's a borderline case of baldness. Suppose, in fact, that you're omniscient, in the sense that you know exactly which possible world you inhabit.

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- Dorr: if you know all the relevant facts, and p is vague, then it will be indeterminate whether you know p (but supertrue that you're not ignorant/uncertain.)
- Schiffer: you end up in some *sui generis* state, which is somehow not the same as uncertainty.

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- Premise: intuitively, this kind of behaviour is only ever appropriate when you are uncertain about p.

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  - You should be more sure the second one is green, than the first one.
- You should be at least as certain that the patch is green or Cedric is bald, than you are that the patch is green.

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- Should be between 90% and 100%.

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  - It's supertrue that: $0 \leq n \leq 99$
  - For each $0 \leq k \leq 99$ it is vague whether $n = k$ (assuming there are at least 100 borderline cases of smallness.)

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- (Contrast: Field predicts it should be 0%).

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- Upshot: if we are to deny that in vague cases you ought to have ordinary credence's, you must allow there to be cases where it is vague whether your credence is an ordinary one, or a weird vagueness related one.
- But it seems like vagueness over whether something is F or G only arises when F and G are very 'close'. (Like being red, and being orange - not like being red and being flourescent green.) So vagueness related uncertainty must be 'close' to ordinary uncertainty.

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- Representation theorems: if your desires are well behaved, Cr should be a probability function (and it's unique.)

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Bets and borderline cases

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    - **Dominance**: if you prefer A over B according to each admissible precisification, then you should prefer A to B simpliciter.
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  - **Dominance**: if you prefer A over B according to each admissible precisification, then you should prefer A to B simpliciter.
- Dominance appears to explain our intuitions about about finding it more likely that the greener patch is green.
- But would you prefer a bet on the second patch being green over the first?

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- Suppose that legally, when they die, it will be indeterminate whether I own the £100 or the state does.
- Suppose all I care about is owning money.

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- Here it seems like dominance kicks in: I should go for the greener borderline green patch.

Preference indifference

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If this principle is remotely plausible then we have a problem for the decision theoretic defence of the Born rule.

Branching Newcomb scenarios

picture

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- My two boxer intuitions say I should definitely prefer A to B, thus violating preference indifference.

Tentative thought

- Perhaps branch weight is just a measure of how much causal influence your current actions have on what happens in the succeeding branches.