Aristotle thinks we are composed of three types of components:
- matter
- form or nature
- accidents.

The form of $x$:
1. unifies the matter into $x$
2. specifies objective norms for $x$’s functioning as the kind of thing it is
3. guides $x$ characteristic activity towards the fulfillment of the norms.

The norms do not reduce to statistical facts about actual functioning.
1. A crazed person cuts off the left ear of every panda: the resulting pandas are all abnormal.
2. But typically the statistically typical is within the normal range.

Lectures 3 and 4 argue that:
- We have forms that do not reduce to the arrangement of matter.
- Especially given the fact of evolution, Aristotelian metaphysics needs theism.
• Argument that we have forms is like Lewis’s argument in *Plurality of Worlds*.
• Forms are useful:
  • Specificity of apparently arbitrary parameters in:
    • ethics
    • epistemology (including a solution to the problem of priors)
    • semantics
    • metaphysics
  • Metaethics
  • Philosophy of mind.
Marin Mersenne’s questions (1624):

Who gave more strength to the lion than to the ant? Who made it be that earth is not in the moon’s place, and that the planets aren’t larger or smaller, closer or further? Who has ordered all the parts of the world as we see them? ... Why is the moon 56 earth-radii away from the earth? Why is the sun 1182 [earth-radii] away from us at its apogee? ... and why is its distance at perigee not other than 1101 [earth-radii]? ... I could equally ask you about Saturn, and Jupiter, and Mars ... 

His answer is a rhetorical question:

Was it not God?

Initially looks like fine-tuning argument.
The fine-tuning argument (FTA)

- Why is constant $\xi$ approximately equal to 3.452?
  1. **Good**: $\xi$ being approximately 3.452 supports life.
  2. **Likely**: So, $P(\xi \approx 3.452 \mid \text{God})$ is big.
  3. **Unlikely**: But $P(\xi \approx 3.452 \mid \text{no God})$ is small.
  4. So, probably God exists and his creative activity explains why $\xi \approx 3.452$.

- Mersenne can get an analogue to **Unlikely**. Very unlikely that the laws of nature predict the precise stuff he cites.

- But he has no analogue to **Good** and hence to **Likely**.
A better reconstruction

1. **PSR:** Everything contingent has an explanation.
2. **Not necessary:** Detail in the world too arbitrary-looking to be necessary.
3. **Not science:** Science cannot explain all this arbitrary-looking detail.
4. **Creation:** God’s creative activity can explain it.
5. So, probably God exists and his creative activity explains the detail.
A better reconstruction

1. **PSR:** Everything contingent has an explanation.
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- PSR is avoidable: can just do inference to best explanation.
- Mersenne spends lots of time giving the detail to support **NOT NECESSARY** and maybe **NOT SCIENCE**.
- **CREATION** is unproblematic.
- **NOT SCIENCE** suffers from neglect of stochastic explanations.
  - FTA responds that parameters more likely on theism than on randomness.
  - But Mersenne doesn’t have **GOOD**.
  - But there is a different approach: Cases of detail where science is useless.
- And I will argue for (normative) human nature, not directly for God.
Should typically benefit father over a stranger.

But if the benefit to the stranger is much larger, should benefit stranger.

How much larger does it need to be?

Problem applies to all sorts of relationships, and needs to take into account lots of detail.

Should benefit $b$ over $a$ in circumstances $C$ when the benefit is bigger than $f(a, b, C)$.

Mersenne questions: Why is the switchover where it is? What explains the values of $f$?
One can be reasonable in choosing either way between being a decent mathematician and a decent musician.

But it is unreasonable to be a weak mathematician (or musician) rather than a superb musician (or mathematician).

Should prefer \( f(g_1, g_2, C, n) \) units of good \( g_1 \) over \( n \) units of good \( g_2 \) in circumstances \( C \).

**Mersenne question:** Why are the values of \( f \) as they are?
Other things being equal, we should prefer social goods over solitary pleasures.
But why? Social goods and solitary pleasures are incommensurable.
There is an ordering between incommensurables.
Intuition: The ordering would be different for intelligent sharks.

**Mersenne question:** Why is the ordering for us as it is?
Some will accept a 92% chance of winning $1,000 at the cost of a 9% chance of losing $10,000.

Some won’t.

Both can be rational.

But some attitudes towards risk are irrational.

There is no finite good $G$ such that a one-time 0.01% chance of $G$ is rationally worth risking a 99.99% chance of a century of the worst tortures the KGB was capable of.

But if $G$ is big enough, expected utility is positive.

So, have a distinction between rational risk acceptances and irrational ones (and dependent on relational issues), beyond expected utility.
Many other questions

- Strict deontology: shouldn’t torture one innocent person to save a million, but should induce a pinprick.
- Threshold deontology: shouldn’t kill one innocent person to save two, but should kill one to save a million. (Philip Swanson)
- When a government becomes sufficiently unconcerned with the well-being of the people, it becomes illegitimate.
- Punishment should not be disproportionate to the gravity of the offense and the culpability of the offender.
- A sufficiently small risk of condemning an innocent person can be tolerated to ensure the guilty do not escape.
- Double Effect: may tolerate an unintended bad effect for the sake of a proportionate good.
- Standards of consent for sex are notably higher than for medical procedures.
- We should not cooperate too closely with evildoers.
- Mersenne questions: Why do all these lines lie where they do?
Quick unsatisfactory answers

- **Act utilitarianism:** The lines are contextually drawn to maximize utility.
  - Well known counterexamples to act utilitarianism.
  - And utilitarianism is crude without a hierarchy of goods/pleasures/etc., which raises Mersenne questions.
- **Relativism:** The lines depend on the individual or society.
  - We haven’t actually settled where the lines are.
  - Implausible that our agonizing is mistaken.
  - New Mersenne question: What strength of belief or consensus is needed to constitute ethics?
- **Virtue ethics:** The lines are drawn where the virtuous person would draw them (Aquinas).
  - Pushes the question back: Why is it that the virtuous person draws the line there?
- **Brute fact:** The lines are unexplained necessary truths.
  - Such parameters are unlikely to be necessary.
  - Brutishness is only a last resort.
Rule utilitarianism

- Lines drawn where the most valuable consequences are obtained. We don’t know where the lines are, but there is a principled ground for the correct answer.
- But as for act utilitarianism, Mersenne questions come up for hierarchy of goods.
- Also, for rule utilitarianism not to collapse into act utilitarianism, the theory formulation must be hypothetical but not too idealized. “Follow the rules such that if all tried sufficiently hard to follow them, the results would be optimal.”
- Mersenne questions come up regarding degree of idealization.
Vagueness and logic

- The lines are drawn in vague places.
- But classical logic says that there must be a fact as to where they are.
- Suppose the following material conditional is true for all $n$:
  - If giving $n$ to a stranger is less good than giving $100$ to one's father, then giving $(n + 1)$ to a stranger is less good than giving $100$ to one's father.
- But giving $0$ to a stranger is less good than giving $100$ to one’s father.
- A million applications of *modus ponens* yield: Giving $1,000,000$ to a stranger is less good than giving $100$ to one’s father. Absurd!
- So the material conditional must fail for some $n$.
- But it can fail for at most one $n$.
- So there is a cut-off, even if we don’t know where. (Cf. Sorensen)
Maybe we can locate the vagueness in our ethical language: our complex linguistic practices determine the answers, but we are not in a position to say what the determination is.

This is only plausible if the ethical questions are merely verbal, if ethical vocabulary is significantly non-natural (Lewis) or far from structural (Sider).

And it doesn’t fit with our agonizing over ethical decisions.

Practically, this is like relativism.
Maybe lines are vague.

But if lines are vague, there will be vagueness profiles.

“At $n_5$, it’s vague and at $n_{10}$, it’s definite. At $n_{11}$, it’s definitely definite, but at $n_9$, it’s vaguely definite. At $n_4$, it’s vaguely vague, and at $n_6$, it’s definitely vague.”

This multiplies Mersenne questions: Why are the vagueness profiles what they are?
Some physicists hope that there will be a final physics where all fundamental parameters are like \( \pi \) and 2, and all other parameters follow logically.

Perhaps the final ethics will have only natural fundamental parameters, and everything else will follow logically?

In physics, the sheer number of parameters, our epistemic distance from a plausible final theory that lacks arbitrary parameters, and the appearance of contingency in the parameters militate against the hope.

Ditto for ethics.

Also, we have the appearance of contingency: think again of intelligent sharks.

And in ethics even \( \pi \) seems unnatural.
Divine command

- Legislation can set reasonable values to arbitrary parameters to solve coordination problems. (Speed limits, tax rates.)
- If duty is what God commands or will, then God can command or will all these parameters.
- Problems with command version:
  - Hard to see where such detailed commands are expressed. (Bible, tradition and intuition lack such precision.)
  - Parameters regarding what counts as a divine command: degree of promulgation, question of what events in the world count as divine speech acts.
- Problems with will version:
  - Surely God does not will us to follow his unexpressed will. But if it’s expressed, we have the same problems.
Natural law and parameters

- Human nature can specify fine parameters (or ranges of them) of how we should behave.
- Answer to Mersenne question is: “Because our nature says so.”
- Parallels other parameters, such as normal height range for humans or actual mass for electron.
- No surprise that just as normal height is not directly epistemically accessible by introspection, so too the ethical parameters are not easily accessible.
- Things tend to fulfill their form, so there’s a pull towards behaving within parameters.
- Can get some insight into the values of the parameters from human behaviour, especially when it is likely to be less distorted by vice.
- Independently very plausible that many of the ethical parameters depend on the ecological niche proper to the kind of agent.
Kantian universalism makes ethics be the same for all rational beings.

Relativism makes ethics be different for different beings of the same kind.

Natural law relativizes ethics to a natural kind. That seems right.

Get a metaethics that avoids the opposite errors of Kantian universalism and relativism.
Other sources of norms

- Cannot define the parameters in terms of statistical norms, because sometimes humans do wrong as a collective (e.g., tribalism).
- Evolutionary definitions of norms in terms of patterns of behavior that evolved conducing to the survival of the species are dubious:
  - If we met other intelligent beings (dolphins? aliens? angels? God?), we would have duties towards them.
  - Ethical norms should be ethically relevant, but prehistorical questions about what behaviors conduced to the survival of the species a hundred thousand years ago are ethically irrelevant:
    - Ethics needs norms intrinsic to us.
  - Probably some of our duties to the vulnerable or to outsiders clash with evolutionarily beneficial behaviors.
- Norms grounded in Platonic realm are not as intrinsic to us as Aristotelian forms.
Avoiding error and pursuing truth

- William James says we (reasonably) vary in how we balance avoidance of error with pursuit of truth.
- We can believe nothing and avoid all error (and get no truth).
- We can believe everything and get all truth (and get all error).
- The reasonable person avoids the extremes.
- But how far away from the extremes should we go?
- Cf. Bayesian problem of credential threshold for outright belief.
Speed of induction

- How fast should one’s credence that all ravens are black increase as one observes more and more black ravens?
- Requiring billions of cases to get credence 0.80 is unreasonable.
- Letting two cases give one credence 0.99 is unreasonable.
- The reasonable person takes all deliberate speed in increasing credence.
- Cf. Bayesian problem of priors.
Problem of priors

- Roughly: We need more evidence to confirm what is *a priori* less likely, but what defines the *a priori* probabilities?
- Bayesian story:
  - We start with some credence $p_0$ such that $0 < p_0 < 1$ for a hypothesis $H$.
  - We then gather evidence $E_1, E_2, \ldots$ and the credence evolves via Bayes’ Theorem: $p_n = p_{n-1} \cdot \frac{P(E_n|H \& K_{n-1})}{P(E_n|\sim H \& K_{n-1})}$, where $K_{n-1}$ is background knowledge.
- But what is $p_0$?
- Convergence theorems say that no matter what $p_0$ is, as long as $0 < p_0 < 1$, with enough data we converge close to 0 or 1.
- But if $p_0$ is close enough to 0 or 1, it will stay there longer than sun will live.
- Formal accounts of priors:
  - Technical problems.
  - Parameters to be tuned.
  - Arbitrary choice of language.
- Mersenne question: Why are the lines to be drawn where they are?
A lesson from an example

- Let $G_p$ be the theory that gravitational force is $F = \frac{Gm_1m_2}{r^p}$.
- It was once irrational not to assign a credence greater than $1/2$ to $G_2$.
- But $G_{2+\epsilon}$ is empirically indistinguishable to our instruments from $G_2$ if $\epsilon$ is small enough.
- The only way the credence in $G_2$ can rise above $1/2$ is if for the vast majority of the small values of $\epsilon$ (even ones we can write down explicitly) the prior probability of $G_2$ is much, much bigger than that of $G_{2+\epsilon}$.
- But how big should the prior $P(G_2)$ be? If it’s too big, then we will accept Newtonian gravity \textit{a priori}, which is also irrational.
- Nicer hypotheses (more beautiful ones?) should have higher priors, but how much higher?
- \textbf{Mersenne question:} Why should the line between reasonable and reasonable priors be drawn where it is?
- Some room for individual variation, but not a free for all.
Plausibly, epistemology parameters should be relative to the kind of agent (Hawthorne) though not to the individual.

Agents embedded in nicer universes would do well to have higher priors for nicer hypotheses than agents embedded in crummier universes.

The characteristic form of life of the agent should affect how cautious the agent is with jumping to conclusions:

- Kinds where the individual matters less can have individuals that are more epistemically adventurous allowing social epistemic exploration.
- Kinds where the individual or society is more fragile may need to assign a serious probability to a greater number of hypotheses.

So, we have some reason to think that the parameters in epistemic practices should be kind-relative.
We should think in ways that are normal given our nature.

The parameters governing rational thought are accessible to us:

- Aristotelian natures guide behavior towards the the goals set by the natures, and hence majority practice tends to be normal.

Thus, the broad range of epistemic parameters (e.g., priors) in typical human practice—reverse engineered from their behavior—is a guide to what is normative to humans.

But it is not what defines the normative, since it is possible, albeit unlikely, that almost everyone is irrational in most things.

What defines the normative is human nature itself.
Human nature answers the Mersenne question of why the lines are drawn where they are: they are where they are because of our nature.

Our nature is a genuine metaphysical component in us, a form, and not reducible to statistical or evolutionary facts.

Tempting to ask: Why do we have this nature?

Easy answer: We can have no other, since our nature is essential to us.

But remaining puzzle: Why do the dominant bipeds on earth have this nature?

Next time: This question. Also, how forms solve some problems in metaphysics and philosophy of mind, and how they require God.