Reflection

1. Awad distinguishes between different "types" of AI. What classification scheme does the paper use and why do these types matter for scientific research?
Predictive, descriptive, generative, optimization, causal and interpretable, privacy aware, and meta science Ai are the types. These types matter because they tackle diverse needs: description of data, causal understanding, ethical data handling, and automated discovery. They enhance every stage of science while raising issues of transparency, ethics and human led inquiry.

2. Does Awad make a clear distinction between AI as a tool and AI as a scientific collaborator? Yes
If so, what are the differences and what are some examples given to support the differences? Ai as a tool which is a helper that does boring or hard parts for humans such as AlphaFold quickly guessing protein shapes, ChatGPT writing code or summarizing papers, software that finds patterns in huge datasets. Ai as a collaborator is more like a teammate that thinks and creates on its own. Systems that invent new hypotheses, plan lab experiments, or connect weird ideas from biology and physics that humans didn't notice.
Do these examples suggest a real shift in how science is conducted, or mostly an extension of existing methods? These new tools make science quicker and could do parts of the scientific method like coming up with what if questions that could change how science gets done in the future.

3. What are some limitations or risks of using AI in science? How do these relate to issues such as interpretability, bias, reproducibility, or theory formation?
The black box problem produces results but can't explain why. Scientists hate that because you need to understand the reason which is interpretability. Bias is if the data the AI learned from is unfair or wrong, the AI will keep making unfair or wrong predictions.Reproducibility is when other scientists can't always get the same result because the model is secret, the data is messy, or the AI hallucinates. Theory formation is when the AI finds a pattern but doesn't really build big theories the way humans do with logic and experiments.

4. According to Awad's arguments, is AI more likely to *accelerate* scientific discovery or to *reshape* the scientific method itself? Do you agree or disagree? Both, since the AlphaFold example speeds things up a lot and takes a shorter amount of time to complete a problem but can also reshape since it can think of hypotheses and run virtual experiments with almost no human help.