The Paradigm Discourses

"Ignoring"

To see, or not to see, that is the question.

"So, we have seen that the foundation of the scientific method is observation and hypothesis building. To be a professional scientist, one must refine and practice one's observational skills. Good hypotheses are based on good observations." With a flourish, Dogma finished his lecture, "Good scientists see everything."

Paradigm flinched, even while the audience provided a hearty applause.

Dogma's lecture had been refined, logical, even humorous. It was the first time Paradigm had sat through it; it was far from the first time Dogma had delivered it. Experiment, with a sidewise glance at Theory, voiced the first question, "What's more important, observation or hypothesis?"

Before he had quite realized it, Paradigm answered, and answered rather loudly, "Neither. The most important process is ignoring." Oh, boy, he'd done it again. He looked around, and sure enough, everyone was looking at him. He would have just moments to come up with an explanation for that counter-intuitive claim.

Dogma starred at Paradigm in stunned silence. With an exasperated sigh he said, "Ignorance is what Understanding has taught us to overcome, now you want to elevate it to a high principle? That's just ludicrous."

"Not ignorance," Paradigm responded, "ignoring. There's a difference." He looked over at Understanding hoping for some help, but his mentor's expression was static, with at best a hint of amusement. Paradigm was on his own.

Dogma pressed his advantage. "As I explained in the lecture, the scientist collects facts, he organizes these facts, his *observations*, according to the patterns they display, and from those patterns he uses imagination to frame one or more hypothesis. Then he tests those hypotheses against more facts…" "That's where I come in." chimed Experiment. Ignoring the interruption Dogma continued, "until only one hypothesis is left which explains them. Then this whole body of knowledge, facts, patterns and hypothesis is passed onto…" letting his sentence trail off, he motioned toward Theory, who took an exaggerated and dramatic bow, then winked at Experiment. "Exactly." Dogma finished.

Thinking furiously, Paradigm stalled for time. "Cannot the facts be organized into different and sometimes incompatible patterns?" he asked. "Only early on," interjected Reason, "but as more and more facts are uncovered," off to the side Experiment winked at Theory, "fewer and fewer hypotheses can encompass all the facts. Eventually one hypothesis prevails." With a rush, Curiosity chimed in, "Like the theory of gravity!"

"Excellent example." said Dogma. A bell went off in Paradigm's mind, he straightened up, "Yes, the theory of gravity is an excellent example – an excellent example of ignoring."

"What?" Erupted simultaneously from several quarters. "You had better explain," said Logic, "because I don't see it." Marshalling his thoughts, Paradigm paused, then continued, "The genius

of what's-his-name was in seeing that an apple and a moon were the same, when clearly they are not. An apple is small, organic, local, fleeting, edible; a moon is huge, inorganic, remote, permanent, and unless you believe the fairy tales, most certainly not edible. The key conceptual breakthrough was to ignore all the ways they were different until only the ways they were the same were left. The differences were eliminated from consideration until only mass was left, the only property they have in common. The key to abstraction is ignoring not observing."

For a moment, the room was silent. Dogma shook his head, "Maybe, but your example is the exception, not the rule. Normal science proceeds by observation, accumulating enough facts to reveal patterns so that Experiment and Theory can go to work." For a while, nobody said anything. It was a rare thing to watch this group immersed in communal silence. Then Understanding piped up, "Mathematics, would you share with the group the sequence you encountered and showed to me the other day."

"With pleasure." Mathematics pulled out a bundle of papers shuffling through them until he found the one he wanted, then went to the board and wrote down the following five symbols, starting with a capital 'M' perched on an underscore

Turning to face everyone, he said, "We believe that these five symbols form a sequence, a pattern that can be extended, but we can't even figure out what the sixth symbol is, much less the complete set. Logic and Reason have been assisting me, but everything we've tried has felt incomplete." He held up the bundle of papers filled with scribbles, notations, speculations and derivations. Perhaps you can see," he glowered at Paradigm, "what we've missed." He had obviously spent serious time on this problem.

Curiosity was already at the board intently looking at each symbol. Glancing back, she said, "I'm going to go with Dogma and Mathematics on this one, the facts are all in front of us, how hard can it be to put them into a revealing pattern?" For the next several minutes, there was a flurry of activity as various facts and patterns were identified, discussed, modified and rejected. Putting a puzzle in front of this group was a guaranteed crowd pleaser. However, after a while, things began to lag. Not all of the figures had straight lines, not all of the figures had curves, and while all had at least one closed region, two had two closed regions. It seemed as if every identifiable pattern had an exception. The group was bogging down.

Paradigm had stood aloof from the activity. His attention alternated between studying the sequence from a distance, watching the antics of those intently trying to crack it, and in trying to discern why Understanding had chosen this moment to present a simple puzzle. At least it had given Paradigm some time to try to frame arguments in support of his *ignoring conjecture*.

Then inspiration struck. Standing directly in front of the sequence, he closed first one eye, then the other. That didn't seem to help, but then he noticed that every figure was bilaterally symmetric; they had something in common after all, a symmetry. Looking around he spied a blank sheet of paper with a clean straight edge. He held this up in front of him blocking the right half of each figure. They looked strangely familiar, and his excitement grew. After a moment, he moved the paper, so it covered up the left side of each figure. Then in turn he felt stupid, inspired, and relieved. He went up to the board and wrote down this figure right after the 5th one.

"That's the sixth figure," he said. Dogma almost shouted, "You didn't even join us in isolating and organizing the facts. You just sat back there staring at the sequence, and now you would have us believe that you've solved it just by looking at it? Your symbol, unlike all the others, doesn't even have a single closed region. Mathematics has been working on it for weeks and it stumped him, and he's been with us far longer than you have."

"True," replied Paradigm, "but that is in fact exactly how I solved it, I just saw the solution. There was no derivation, no hypothesis formulation, testing or rejection. The answer just appears. And…" he waited for dramatic pause, "the secret was what to ignore, not what to see."

"Proof, come over here." At his invite, Proof sauntered over. Paradigm whispered, "Take this paper and cover the left half of each figure." While Proof complied, Paradigm looked over at Understanding, who had that pleased look a teacher acquires when a student finally 'gets it'.

Then from Proof, "Oh, Gödel." Turning around, "Paradigm's right, he solved it." Adding, "There will be three more figures in all, and I know what each of them will be – you will too. Here, all the rest of you take a look." One by one they did, Dogma going last. With a strained look, he took the paper and blocked the left half of every symbol. There they were, the decimal integers from 1 to 6, clear as day.